Diagnosis, Achievement, and Social Inequality: The Correlates and Consequences of Children's Mental Health Diagnoses

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Abstract

Most research on children's mental health focuses on symptoms thereby overlooking the correlates and consequences of diagnoses. While there is evidence that both symptoms and diagnoses are asymmetrically distributed across social groups, the social predictors of mental health diagnoses remain understudied. Additionally, the negative association between diagnosis and children's academic achievement is only vaguely understood, as most prior research documenting the negative association between children's diagnosis status and education has overlooked consideration of symptoms and other potentially confounding sociodemographic factors. Thus, the unique association between diagnosis and achievement remains unclear. Moreover, most prior research has typically examined the general (or overall) negative association between diagnosis and achievement, and not considered whether the consequences of diagnosis vary by family background. Diagnoses are given to children from families across the social class and race/ethnicity spectrum; therefore, they encounter diagnoses with varying levels of economic, cultural, and schooling resources, ideologies, and experiences. These differences may result in varying effects of diagnosis on children's outcomes, and investigation of the moderating effects of social class and race/ethnicity can help further understand how social status and mental health intersect in the creation of educational (and social) inequality.

Thus, to extend current research and fill a void in the study of social inequality and children's mental health, use data from the Early Childhood Longitudinal Study – Kindergarten cohort (ECLS-k) to address these points by examining the correlates and

consequences of mental health diagnoses, with particular attention given to children's academic achievement. Specifically, I investigate (1) the role of social class and race/ethnicity in shaping the process leading-up to and receipt of an internalizing or externalizing mental health diagnosis, (2) the association between attention-deficit hyperactivity disorder (ADHD) and emotional disturbance (ED) diagnoses and children's academic achievement between kindergarten and eighth-grade and the moderating effect of social class and race/ethnicity, and (3) whether family and schooling resources help account for the negative association between diagnosis and achievement and can be used to explain the differential consequences across social class.

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Chapter 1. Introduction

Research on mental health tends to focus on the correlates and consequences of mental health symptoms, and this is especially true of studies of children. Mental health symptoms are inversely associated with social class, and negatively related to children's educational outcomes (Crosnoe 2006; Currie and Stabile 2003; Graziano et al. 2007; Lansford et al. 2006; McLeod and Kaiser 2004; McLeod and Nonnemaker 2000; McLeod and Shanahan 1993; McLeod and Shanahan 1996; Miech et al. 1999; Warren 2009). In this regards, mental health symptoms appear to operate as yet another transmitter of social inequality, wherein the environmental conditions of disadvantaged children alter their internalizing and externalizing well-being, which detracts from their educational performance and given the importance of education for later-life success, perpetuates the stratification structure of society (Jayakody, Danziger and Kessler 1998; Wang et al. 1999). While it is undoubtedly important to recognize the role of mental health symptoms in the transmission of advantage, there are other less-studied aspects of mental health to consider, namely diagnosis.

Diagnosis is different than mental health symptoms. Diagnosis, in the medical sense, designates a qualitative break point on a continuum of symptoms that differentiates normal from abnormal, health from illness, and wellness from "sickness" (Aneshensel and Phelan 1999). Yet, diagnoses are inherently social products as well, especially invisible disabilities such as attention-deficit/hyperactivity disorder, depression, or anxiety (i.e., mental health diagnoses), and though individuals with more symptoms of mental health problems are more likely to be diagnosed, the connection is imperfect (Barnes, 2008; Brown, Meadows, and Elder, 2007; Chabra, Chaves, Harris, and Shah,

1999; Fabrega, Mezzich, Ulrich, and Benjamin, 1990; Nikelly, 1988; Szaz, 1963). Sociology has nevertheless tended to bypass consideration of mental health diagnoses and focused primarily on symptoms.

Children with mental health diagnoses have not gone unstudied however, as over the last twenty years education and health policy researchers have increasingly focused on the correlates and consequences of diagnoses (Barkley et al. 1990; Barry, Lyman and Klinger 2002; Blackorby et al. 2005; Wagner et al. 2003). Evidence from this body of research suggests that diagnoses share many qualities with symptoms, in terms of their predictors and consequences. For example, similar to symptoms of mental health problems, mental health diagnoses are more prevalent among boys (Schneider and Eisenberg 2006). Additionally, children with mental health diagnoses, much like children with more symptoms of mental health problems, tend to struggle in school and are more likely to drop-out (Breslau et al. 2008; Bussing et al. 2010), be retained a grade (Barkley et al. 1990; McGill-Franzen and Allington 1993), and receive lower grades (Wagner et al. 2003).

Nevertheless, other evidence indicates important differences between the two, suggesting that diagnoses and symptoms are not synonymous. First, symptoms of mental health problems are more prevalent among disadvantaged children, but mental health diagnoses are unclearly distributed across social classes (LeFever, Dawson and Morrow 1999; Schneider and Eisenberg 2006; Visser, Leasesne and Perou 2007). Furthermore, there is an asymmetrical distribution of symptoms and diagnoses across racial/ethnic groups, as symptoms are more highly concentrated among historically disadvantaged minority groups (i.e., African American and Hispanic children), and diagnoses are more

prevalent among white children (Pastor and Reuben 2005; Schneider and Eisenberg 2006). Next, the negative consequences of mental health diagnoses for children's academic achievement are only vaguely understood, as most prior research documenting the negative association between children's diagnosis status and education have often not controlled for symptoms and other potentially confounding sociodemographic factors (e.g., Eisenberg and Schneider 2007; Trout et al. 2003; Wagner et al. 2003). Thus, it is unclear if diagnosis is associated with academic achievement. Additionally, most prior research has demonstrated the negative effect of diagnosis status by comparing diagnosed with *all* non-diagnosed children. Yet, not all individuals are at risk of being diagnosed with a mental illness; therefore, greater consideration can be given to the construction of the appropriate comparison group. Finally, earlier research has typically examined the general (or overall) negative association between diagnosis and achievement, but has not considered whether the consequences of diagnosis vary by family background. Diagnoses are given to children from families across the social class and race/ethnicity spectrum; therefore, they encounter diagnoses with varying levels of economic, cultural, and schooling resources, ideologies, and experiences. These differences may result in varying effects of diagnosis on children's outcomes, and investigation of the moderating effects of social class and race/ethnicity can help further understand how social status and mental health intersect in the creation of educational (and social) inequality.

Thus, to extend current research and fill a void in the study of social inequality and children's mental health, I address these points by examining the correlates and consequences of mental health diagnoses, with particular attention given to children's academic achievement. Specifically, I investigate (1) the role of social class and

race/ethnicity in shaping the process leading-up to and receipt of an internalizing or externalizing mental health diagnosis, (2) the association between attention-deficit hyperactivity disorder (ADHD) and emotional disturbance (ED) diagnoses and children's academic achievement between kindergarten and eighth-grade and the moderating effect of social class and race/ethnicity, and (3) whether family and schooling resources help account for the negative association between diagnosis and achievement and can be used to explain the differential consequences across social class.

Background Literature

Children, Mental Health, and Social Stratification

In both adults and children, symptoms of mental health problems tend to be inversely associated with social advantage (Chen, Martin and Matthews 2006; Haas 2006; House et al. 1994; Kitigawa and Hauser 1973; Kozyrskyj et al. 2010; Miech et al. 2006; Syme and Berkman 1976). That is, children from disadvantaged families tend to display more depressive symptoms, have higher levels of aggressive behavior, and generally experience poorer mental health (Strully 2009) than their advantaged peers. Although prior research has primarily linked social advantage with social class, the inverse association between advantage and mental health also appears across race and ethnic groups (e.g., Brown, Meadows and Elder 2007; Schmitz 2003). Specifically, historically disadvantaged minorities, such as African Americans and Hispanics, tend to display higher levels of hyperactivity, and exhibit more antisocial and disruptive behavior (Schmitz 2003; Strohschein 2005) than their white counterparts, and this may be particularly true for minorities living in impoverished conditions (McLeod and Owens 2004).

Since working-class/poor and racial/ethnic minority children display more symptoms of mental health problems, it might be expected that disadvantaged children be over-represented among individuals with a mental health diagnosis. Net of children's mental health symptoms, it might also be expected that social class and race/ethnicity would no longer be associated with mental health diagnosis. Yet, increasingly there is evidence of another trend wherein advantage is associated with an increased likelihood of diagnosis, especially for disorders such as ADD/ADHD and depression, and instead of disadvantaged children being over-represented among the diagnosed, they are actually underrepresented. For instance, LeFever, Dawson, and Morrow (1999) found that white children were more likely to be diagnosed and receiving medication for ADHD than African American or other minority children. Similarly, Schneider and Eisenberg (2006) used data from the Early Childhood Longitudinal Study – Kindergarten cohort to document the disproportionate number of white children diagnosed with ADHD relative to their minority peers, net of children's externalizing behaviors. Additionally, Pastor and Reuben (2005) used data from the National Health Interview Study and showed that children from families with higher annual incomes were more likely to be diagnosed with ADHD.

There is thus mounting evidence that social advantage is positively associated with certain mental health diagnoses despite higher-levels of symptoms among the disadvantaged. The disjunction between symptom-levels and diagnosis status reaffirms the importance of social context in "distinguish[ing] disordered or dysfunctional responses from normal ones" (Kirmayer and Young 1999, pg. 450). Furthermore, the disconnect between the medical status (i.e., mental health symptoms) and social status

(i.e., diagnosis status) suggests that the process linking the two may contribute to the more frequent diagnosis of advantaged children. That is, the stages that individuals must transition through to eventually become diagnosed may unduly favor white and middle-class individuals resulting in their apparent over-representation among diagnosed children. Thus, children diagnosed with mental health problems arrive at the diagnosis after first passing through prerequisite stages (e.g., parental concern and professional evaluation), and during these stages the composition of individuals eventually diagnosed may be importantly altered. However, prior research on health inequality has typically overlooked this process when describing who gets diagnosed. Understanding who is diagnosed thus requires examination of the social process preceding the diagnosis.

Mental Health and Children's Academic Achievement

Symptoms of mental health problems are negatively associated with educational outcomes. Children's levels of externalizing problems (e.g., hyperactivity, disruptiveness, and aggression) have implications for children's early and later educational performance, as classroom behaviors in first grade have been linked with learning in first grade, as well as second grade and fourth grade (Alexander, Entwisle and Dauber 1993). In addition to receiving lower grades and demonstrating poorer academic skills in elementary and middle school, youth who exhibit signs of internalizing and externalizing problems are also more likely to fail a class in high school, drop out of high school, and not enroll in postsecondary education (Coutinho and Denny 1996; DiLalla, Marcus and Wright-Phillips 2004; Ensminger and Slusarick 1992; Entwisle, Alexander and Olson 2005; Farmer and Bierman 2002; McLeod and Fettes 2007; McLeod and Kaiser 2004; Needham, Crosnoe and Muller 2004).

Evidence from these studies points to a negative association between mental health problems and children's academic achievement, but all these studies considered the association between children's mental health *symptoms* and academic outcome. Some effort has been made to move beyond simple measures of symptoms. For example, McLeod and Fettes (2007) constructed latent classes of internalizing and externalizing problems, which identified children's symptom levels and changes in these levels over time. These latent groupings were used to predict high school completion and post-secondary involvement. Not surprisingly, McLeod and Fettes found that children who sustained high levels of mental health problems throughout childhood and adolescence and those who had increasing symptoms of mental health problems over the early life-course were least likely to graduate from high school and enroll in post-secondary schooling. Still, their analysis did not identify "diagnosed" individuals, and very few sociological studies have examined the relationship between diagnosis and children's academic achievement. Indeed, education and health policy researchers have produced the majority of evidence on the antecedents and academic consequences of children's mental health diagnoses.

Examining children's mental health provides the opportunity to consider an array of possible issues, especially when it comes to diagnosis. Most often researchers discuss two dimensions of mental health: externalizing and internalizing well-being. Although there are numerous diagnoses that qualify under these broad categories, attention deficit disorder and attention-deficit/hyperactivity disorder (ADD/ADHD) tend to be most commonly studied as an externalizing mental health disorder. It is estimated that ADD/ADHD affects between 3 and 5 percent of all children in the United States (DHHS

1999), and in some districts diagnosis rates have been reported around 20 percent (LeFever, Dawson and Morrow 1999; Smardon 2006). On average, children with ADD/ADHD struggle in school relative to their non-diagnosed peers. For example, Eisenberg and Schneider (2007) found differences in the mean scores of ADHD and non-ADHD boys and girls in math and reading. Similarly, Scheffler and associates (2009) showed a gap in math and reading scores between ADHD and non-ADHD children, and additionally found that the difference increased with time. Maybe not surprising given the lower academic performance of ADHD children, youth identified as hyperactive in childhood tend to complete fewer years of education than their non-hyperactive peers (Mannuzza et al. 1993).

There is no similarly prevalent mental health diagnosis for internalizing well-being; however, researchers have explored the influence of diagnoses often referred to generally as emotional disturbances on children's academic outcomes. In 2003, an estimated 457,000 youth, slightly less than 1 percent of all children in the United States' school system between the ages of 6 and 21 years old, were diagnosed with an emotional disturbance[1] (U. S. Department of Education 2006a; U. S. Department of Education 2006b), though the actual prevalence of ED may be much higher (Institute of Medicine 1994). Children with emotional problems tend to do worse in school than their peers: their math, reading, and writing skills are on average one-year below grade level by the

[1] Emotional disturbance is defined by the Individuals with Disability Education Act as a condition exhibiting one or more of the following traits over an extended period of time and to such a degree that it adversely affects a child's educational performance: (A) an inability to learn that cannot be explained by intellectual, sensory, or health factors, (B) an inability to build or maintain satisfactory interpersonal relationships with peers and teachers, (C) inappropriate types of behavior or feelings under normal circumstances, (D) a general pervasive mood of unhappiness or depression, or (E) a tendency to develop physical symptoms or fears associated with personal or school problems. Emotional disorders consist of depression, anxiety, social phobias, and obsessive compulsive disorder.

time children reach middle school (Greenbaum and Dedrick 1996; Nelson et al. 2004). Further, the gaps in academic skills increase as children transition into high school (Barkley et al. 1990; Scheffler et al. 2009; Wagner et al. 2003). Based upon prior research it would seem rather apparent that mental health diagnoses are negatively associated with children's academic achievement, but two aspects of prior research need more thorough examination before such a conclusion can be reached.

Symptoms versus Diagnoses

Prior research has typically relied on simple mean comparisons to determine the gap in academic performance between diagnosed and non-diagnosed children. For example, Nelson and associates (2004) compared ED children's test performance on the WJ-III with the age-normed performance of non-ED children, and found that 83 percent of ED children scored below the mean of the comparison group. Similarly, the work done by Wagner and her associates (2003; 2002) compares ED children with children who have other diagnoses (i.e., mental retardation, learning disability, emotional disturbance, hearing impairment, etc.), or compares the test scores for the ED children in their data with the performance of non-ED children from another nationally-representative data source (NLSY97). Simple mean comparisons were also done by Frazier and associates (2007), who performed a meta-analysis of studies examining ADHD children's academic struggles, and used a mean comparison to compute the effect size difference in achievement between the diagnosed and non-diagnosed group. While these studies provide important insight into presence of academic gaps associated with mental health diagnosis, they do not allow for thorough consideration of the factors that might confound the relationship. They are unable to determine whether mental health

diagnoses are directly associated with children's academic achievement or if the disparities are due to other factors, such as mental health symptoms.

As discussed earlier, symptoms are negatively associated with children's academic achievement, and children diagnosed with mental health problems tend to have higher symptom levels (by definition). Models comparing the mean scores of diagnosed and non-diagnosed individuals without taking into consideration the role of symptoms are likely confounding the influence of diagnosis with symptoms. Thus, it is unclear if the gaps in performance described by earlier research are indicative of unique deficits associated with diagnosis status, or if they are capturing the omitted influence of mental health symptoms.

Variation by Social Background

Most research tends to examine the overall (or average) association between diagnoses and academic achievement. For example, Barry, Lyman, and Klinger (2002) showed that AHDH children scored around one-half of a standard deviation below non-ADHD children on standardized vocabulary and math assessments, and Bussing and her colleagues (2010) found a nearly one-standard deviation gap between ADHD and non-ADHD children on eighth-grade reading and math assessments. Moreover, Trout and associates (2003), in their review of the literature found that the majority of research in the past forty years showed ED youth performed worse than their non-diagnosed peers in math and reading; however, it was unclear if children from different family backgrounds experience the same declines in performance following a diagnosis.

Children encounter mental health diagnoses coming from a wide range of family backgrounds with varying levels of social and financial resources. It is therefore possible

that the consequences of mental health diagnoses are dependent upon the resources children have at their disposal. For example, the financial resources and parenting practices of middle class families are often identified as important factors in the transmission of social advantage across generations (Bourdieu 1990; Duncan, Brooks-Gunn and Klebanov 1994). Middle-class children diagnosed with a mental health problem still have access to such resources. In comparison, working-class/poor children who are diagnosed with a mental health problem may experience additional hardship, because their families already lack important resources and may thus be more susceptible to the negative consequences of diagnosis. Conversely, children from advantaged families are expected to achieve the most in school, and a mental health diagnosis could impede their attempts toward success. Since advantaged children hypothetically have "more-to-lose" from being diagnosed, it is possible that diagnoses matter more for their academic outcomes than it does for the outcomes of disadvantaged individuals. Thus, beyond simply understanding the association between diagnosis and children's achievement is investigating the potential variability in this association across social groups.

Explanation for Negative Consequences of Mental Health Diagnoses

Despite mounting evidence that mental health diagnoses are negatively associated with children's academic achievement, it is still unclear why this decline exists. One possible explanation is that diagnosed children do less well than their peers because of the symptoms inherent to the mental health problem—depressiveness, hyperactivity, distractability, and anxiety, are just a few psychological factors that typically accompany diagnoses and could slow children's ability to learn (for discussion, see Reid et al. 2004;

Trout et al. 2003). This type of explanation, however, attributes the poorer performance of diagnosed children to characteristics of the individual. Alternatively, mental health diagnoses may matter for academic achievement because of changes to family and schooling factors that occur in response to having a child with mental health problems. That is, the emotional and behavioral displays accompanying mental health diagnoses may disrupt parenting practices and influence children's schooling experiences, by creating a stressful and strained home environment and informing the type and quality of classroom in which children are placed (Blum 2007; Nelson et al. 2004).

According to this second line of explanation, mental health diagnoses set into motion processes that take away from children's exposure to beneficial family or schooling experiences, and these changes to the context surrounding children contribute to their lower learning and academic achievement. Given its focus on children's social context, this line of research offers a reasonable alternative to explanations narrowly focused on individual's characteristics (i.e., mental health symptoms); nevertheless, this explanation (1) presumes that particular parenting practices and schooling quality are changed in response to the diagnosis, and (2) has only been used to study the role of parenting and schooling factors in explaining the overall negative association between diagnosis and achievement, leaving uncertain their relevance in accounting for the possible differential effects of diagnosis across social class.

If mental health diagnoses do matter differently for academic achievement depending on children's social background, then it is important to understand the factors that contribute to the variability in consequences. As briefly mentioned above, middle-class children have access to certain resources that contribute to their better performance

in school, and these differences in family factors also correspond to differences in the quality of children's schooling experiences.

Social class is associated with both parenting practices and classroom quality. For instance, middle class children tend to experience a collection of parenting practices that cultivate their cultural repertories and knowledge of how to operate within the dominant social order, which provides them an evaluative advantage relative to their working-class/poor peers (Bourdieu 1990; Dumais 2006; Lareau 2003; Swidler 1986). Additionally, in the school setting, middle class children are more likely to be placed in high-ability classrooms (Condron 2008; Gamoran and Mare 1989; Oakes 1985), and the normative culture in schools tends to align more closely with middle-class ideals and values, making adjustment to and operation within schools easier for children from advantaged families (Farkas et al. 1990). Social class is thus related to a cultivating family experience and enrollment in classrooms that are most likely to maximize children's learning potentials.

In contrast, mental health diagnoses are associated with disruptive family-life and placement in lower-quality classrooms in school. Hyperactive and inattentive children often increase the levels of stress and strain involved in parenting (Anastopoulous et al. 1992). Consequently, the quality of parent-child interactions in the home and children's involvement with extracurricular activities are compromised (Solish, Perry and Minnes 2010). Thus, children's mental health diagnoses may detract from parenting quality. Mental health diagnoses can similarly hinder the quality education children receive. Children with mental health diagnoses are eligible to receive instruction in special education settings that cater to their individual needs and provide personalized

instruction; however, recent movements toward inclusion have resulted in the mainstreaming of diagnosed children. Although there is evidence that including diagnosed children in the general classroom is potentially beneficial, children with ADHD or ED are more likely to be placed in classrooms with lower-ability peers, as well as congregate toward other academically and behaviorally struggling peers (Farmer and Hollowell 1994; Stone, Brown and Hinshaw 2010). Additionally, teachers are increasingly strained in their efforts to balance the needs of their students' with mental health diagnoses and the other children in the classroom (Finegan 2004). Mental health diagnoses thus tend to contribute to more stress and lower parenting quality in the family, and place children at risk in schools by increasing the likelihood of their inclusion in classrooms that are unlikely to maximize children's learning potentials.

Social class and mental health diagnoses are two forces that have opposing influences on children's family and schooling experiences, and their intersection may help account for differential effects of diagnosis. Understanding the differential consequences of diagnosis thus requires consideration of how families respond to having a diagnosed child.

DATA AND METHODS

Data Set

In order to examine the correlates and consequences of children's mental health diagnoses, I use data from the Early Childhood Longitudinal Study (ECLS-k). Funded by the National Center for Educational Statistics, the ECLS-k collected data from over 20,000 kids during their Kindergarten year beginning in the fall of 1998 (Tourangeau et al. 2006). The sample itself used a "multistage probability sample design to select a

nationally representative sample of children attending kindergarten in 1998-99" (Westat 1999, pg. 4-1). First, a total of 1,335 geographic areas in the United States were identified (typically corresponding to county principalities), from which 100 were selected. Second, all public and private schools offering kindergarten programs were selected using the Common Core of Data (1995-96 wave) and the Private School Universe Survey (1995-96 wave) to form the sampling frame of schools for each geographic area. Additionally, the 1998-99 wave of the CCD and PSUS were used to capture schools opened between 1995 and the start of the survey, and the Department of Defense and Bureau of Indian Affairs was consulted to classify military-base and Native American reservation schools. A total of 18,911 public-schools and 12,412 private-schools were included in the sampling frame. Schools were selected with probability proportional to size, and the number of schools to be sampled per geographic area was determined based upon the population size of the area. A minimum of one school was selected from each of the 100 geographic areas, and a total of 1,280 schools were selected, of which 934 were public schools and 346 were private schools.

Students were sampled from each school. Although the goal was to do a simple random sample of all students in each particular school, an adjustment was made to over-sample for Asians and Pacific Islanders. Therefore, each school had two sampling strata: one containing all Asian and Pacific Islander students, and the second, all other students. Students were given equal weight within each stratum, and twins were considered a single unit in the frame (i.e., twins were treated as "one child" in the sampling frame of students in each school). The goal was to sample 24 students per school (even if this represented a census of a school's kindergarten enrollment). Once children were

selected, parent's information was obtained from the school and they were contacted to determine if the child could participate in the study. An average of 20 children per school agreed to participate and were included in the initial wave of the ECLS-k.

Due to the complex design used to draw the sample for the ECLS-k, it is important that analyses using the data be properly weighted. In particular, ECLS-k programmers created numerous weighting schemas that, when applied, produce results that are nationally representative of children in kindergarten during the 1998-1999 school-year. For the analyses of this project, I implemented the necessary weighting strategy to adjust for the oversampling of minorities and the clustering of students in kindergarten schools.

A total of seven-waves of data were collected for the ECLS-k, corresponding to the following calendar seasons and years: Fall 1998, Spring 1999, Fall 1999, Spring 2000, Spring 2002, Spring 2004, and Spring 2007. Nevertheless, due to the ECLS-k's sampling decisions (i.e., the Fall 1999 wave included only a 30 percent sub-sampling of all children) and its variable construction (e.g., several important family variables, such as income, were only reported for the kindergarten-year not both kindergarten waves) much of the reported analyses only use five waves (excluded waves: Fall 1998, Fall 1999). At each wave, data was collected from child, parent, teacher, and school administrator, to create an encompassing view and understanding of children's family and educational status and progress.

Data Overview

The ECLS-k is unprecedented in terms of its participant size, breadth, and length of coverage from middle-childhood to early-adolescence. It is the first large-scale,

nationally-representative dataset to begin collecting information on children at school entry and follow them through the end of middle-school and/or entry into high school. The primary objective of the ECLS-k was to study "achievement in the elementary years"; however, it was designed with a human ecological framing in mind (Westat 1999, pg. 1-1). Thus, the goal was not simply to monitor children's learning, but to capture and assess the interconnected nature of the individual, social, and educational factors that contributed to gains in achievement. In addition to gathering extensive information on children's home and school situations, the ECLS-k also collected data on children's health, in order to examine its relevance for schooling success. Information was collected on children's height, weight, allergies, physical health (e.g., common cold, flu, etc), and mental health (e.g., internalizing well-being, externalizing well-being, etc.). More than just collecting data on health symptoms, the ECLS-k also asked parents to report children's receipt of health diagnoses, for both physical (e.g., visual, hearing, etc.) and mental (e.g., ADHD, depression, etc.) impairments. Therefore, in addition to the sampling design traits that set apart the ECLS-k from other data sources, it also contains substantial health and diagnoses information, which make this the most ideal data for use in this study.

General Variables. In the empirical chapters that follow, the measures used for each analysis vary slightly depending on theoretical and conceptual focus. Nevertheless, a consistent set of variables is used throughout this project to account for certain child-characteristics. These include, child's gender, race/ethnicity, and social class (i.e., parental educational attainment). Additionally, in chapters 3 and 4, measures are used which more explicitly define children's family context, including family income,

neighborhood quality, family routines, parent-child activities, and parental school involvement. In chapter 4, there are also several controls for children's schooling circumstances, which include classroom ability level, classroom behavior problem, and teacher's attitude toward teaching and school. A more detailed description of these variables is available in the subsequent chapters.

Mental Health Symptoms. Information on children's mental health was collected from parent-, teacher-, and child-reports across multiple waves of the study, including ratings of children's socio-emotional well-being and their diagnosis status. For example, during the Spring 1999 kindergarten wave, parents and teachers were asked to report about children's problems with being accepted and liked by their peers, sadness, loneliness, and low-self esteem. ECLS-k programmers combined the answers to these questions to create a "sad/lonely" scale for children (Westat 1999). Questions related to children's mental health were also asked in reference to their externalizing tendencies (i.e., impulsivity and activity level). During later waves of the study, children were asked to self-report these indicators of mental health, and the responses from parent, teacher, and child are used to construct measures of mental health symptoms.

Mental Health Diagnosis. More important for this project however, are the questions regarding children's mental health *diagnoses*. Diagnoses were classified in two ways for this project. First, in Chapter 2, two general categories of diagnoses were used: "internalizing" and "externalizing". Second, for Chapters 3 and 4, specific diagnoses of attention-deficit hyperactivity disorder (ADD/ADHD) and emotional disturbances (ED) were identified. Both types of measures relied on parents' reports of the type and timing of diagnosis.

Summary of Results

The Social Process Behind Inequalities in Children's Mental Health: An Illness Career Framework

To study the social process associated with children's mental health diagnoses, I begin by comparing the characteristics of diagnosed and all other non-diagnosed children to document disparities in the distribution of diagnoses across social groups. Then I re-analyze the data through an illness career framework (i.e., focusing on the social process preceding diagnosis), whereby three stages of the illness career are examined: (1) whether or not parents were concerned about their children's mental health, (2) whether or not parents had their children evaluated for a mental health problem, and finally, (3) whether or not children were diagnosed with a mental health problem. At each stage, I estimated the association between social class, race/ethnicity, and the likelihood of transition to the next stage.

In line with other contemporary research showing the unexpected pattern whereby social advantage is positively associated with diagnosis status, I find that white and middle class children (i.e., children with more educated parents) are disproportionately represented among those diagnosed with internalizing (e.g., depression, anxiety) and externalizing (e.g., ADD, ADHD, etc.) disorders, net of mental health symptoms. However, this finding was based on a comparison of the characteristics of diagnosed children against *all* non-diagnosed children. Alternatively, using the illness career framework, I show that white and middle class children are more likely to have parents concerned with their mental health issues and, in turn, have their children professionally evaluated. Consequently, once their over-representation at these earlier stages is

considered, white and middle class children are no longer disproportionately represented among diagnosed individuals. That is, race/ethnicity and social class do not predict diagnosis status among children who transitioned through the earlier stages of the illness career and were professionally evaluated. In short, white and middle class children appear more likely to be diagnosed compared to all their non-diagnosed peers because they are more likely to progress through the social process preceding diagnosis. These findings provide insight into the intersection of mental health and social inequality, as well as offer an alternative account of how differences emerge in the distribution of diagnoses in children.

Social Advantage and the Association between Mental Health Diagnoses and Children's Academic Achievement

The link between diagnosis and achievement is difficult to discern, because children's mental health diagnoses represent a constellation of social and psychological factors, and many of the same factors that predict diagnosis are also related to children's academic achievement. These factors include, but are not limited to, symptoms of mental health problems, social class, and race/ethnicity, and must be considered in order to adequately assess the independent association between diagnosis and children's achievement. Furthermore, beyond the question of association between diagnosis and achievement is inquiry into the variability of this relationship across social groups. Diagnoses are given to children from every social class and race/ethnic group; thus, children have access to varying resources that might protect them against or exacerbate further the association between diagnosis and achievement.

I therefore examined the association between children's mental health diagnoses and their academic achievement net of a range of confounding factors to determine the independent association, and then investigated whether the association varied across different social groups. More specifically, I identified all children diagnosed with ADD/ADHD or emotional disturbances (e.g., depression, anxiety, phobia, etc.), and used HLM growth modeling to estimate the relationship between diagnosis and children's math and reading gains from kindergarten through eighth-grade. I find that ADD/ADHD diagnosis is associated with a decline in achievement, while ED diagnosis is associated with a slight increase in achievement, controlling for symptoms, social class (e.g., parental educational attainment), and race/ethnicity. However, the associations between diagnosis and achievement were significantly moderated by children's background, and upon closer inspection, ADD/ADHD and ED diagnoses were negatively associated with academic achievement, but primarily for children whose parents had attained the lowest level of education. The association was less negative and in some cases positive for children with more educated parents. A similar, albeit less distinct pattern was observed for white versus African American and Hispanic children. The relationship between diagnosis and academic achievement thus appears to depend on children's backgrounds, as social advantage insulates children against the negative repercussions of diagnosis. These findings contribute to current explanations of how children's mental health is involved in and related to the production and reproduction of academic (and potentially social) inequality.

Parenting, Classroom Quality, and the Association between Cumulative Childhood Experiences, Mental Health Diagnoses, and Academic Achievement

The final empirical chapter involves a two-part investigation: first, I investigate whether family and schooling factors account for the negative association between diagnosis and achievement, and second, if family and schooling might also be able to explain the differential effects of diagnosis across social classes. According to earlier research, the excessive energy, low self-control, and unexpected mood swings of children diagnosed with ADHD and ED can place additional strain on parents. Additionally, diagnosed children tend to be placed in lower-quality classrooms at school, which results in poorer instruction and lower rates of learning among such children. Yet, most prior research identifying the important role of parenting and schooling factors, and their contribution to the negative association between diagnosis and achievement, have primarily focused on changes in parenting or decline in classroom quality *following* diagnosis. Consequently, I take a more "long-term" examination of children's exposure to family and schooling conditions, by investigating these factors through a cumulative framework.

I thus created two types of parenting and schooling measures: concurrent and cumulative. Concurrent measures are typical time-varying indicators of parenting practices and schooling quality that reflect wave-specific values and emphasize change in these family and school factors. Alternatively, cumulative measures are time-varying indicators of parenting practices and schooling quality that emphasize consistency and persistence by summing together current and prior experiences. That is, the cumulative measures capture the accrual of childhood experiences and examine their relationship with childhood development. I find that concurrent parenting and schooling factors are largely unable to explain the decline in reading and math scores associated with mental

health diagnosis, while accumulated experiences explain most of the negative association between ADHD diagnosis and achievement.

Finally, I investigate whether children's parenting and schooling experiences can account for the differential association between diagnosis and achievement. Given the relationship that children's social class has with parenting practices and classroom quality it is possible that these factors would account for the moderated association between diagnosis and achievement across social class. I again include both the concurrent and cumulative parenting and classroom quality measures in my analysis. I find that concurrent processes in the home and school are essentially unrelated to differential association of diagnosis with achievement. Alternatively, the cumulative parenting practices and classroom quality measures account for most of the differences in the consequences of diagnosis across social class, and again, explain nearly all the detriment associated with diagnosis. Presented results indicate that children's social contexts (i.e., family and schooling circumstances) largely account for the negative association between diagnosis and achievement, and additionally explain the differential consequences observed across social classes. The consequences of diagnosis thus appear to be a reflection of children's context, and not their characteristics.

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Chapter 2. The Social Process Behind Inequalities in Children's Mental Health: An Illness Career Framework

Socially advantaged children generally have fewer mental health problems than their disadvantaged peers; however, there is growing evidence to suggest that white and middle class children are more likely to be diagnosed with certain disorders, such as attention deficit disorder, attention deficit/hyperactivity disorder, depression, and anxiety (LeFever, Dawson and Morrow 1999; Pastor and Reuben 2005; Rowland et al. 2002; Schneider and Eisenberg 2006). In addition to reports from large scale, nationally representative studies suggesting a biased distribution of diagnoses across race/ethnicity and social class, anecdotal accounts and vignette studies also indicate that current psychiatric practices may be particularly sensitive in detecting and diagnosing mental health problems in children from socially advantaged families (Kirmayer and Young 1999; Pottick et al. 2007; Schneider and Eisenberg 2006; Worth 1999). Together, these results have been used to question current mental health treatment practices of disadvantaged children.

While such findings raise legitimate concerns for the mental health profession, an alternative explanation of the over-representation of socially advantaged is possible, if we analyze health inequality by focusing on the social process leading to diagnosis. Mental health diagnoses do not occur in a social vacuum, but represent the culmination of a multi-stage process: in order for children to be diagnosed with a mental health problem, they must first be professionally evaluated; and before that, in order for children to be evaluated, they must first attract the concern of their parent(s) or other caregiver(s). This idea of a multi-stage process has previously been referred to as the "illness career" in

studies of adult health diagnoses. Following this logic, the overrepresentation of more advantaged children among those eventually diagnosed may emerge during the stages *prior to the diagnosis*. Thus, advantaged children may have a greater likelihood of diagnosis because their parents may be more concerned about the possibility of mental health problems and/or because children are more likely to be evaluated, and not necessarily because of cultural or class bias in the evaluation criteria.

To study the social process associated with children's mental health diagnoses, I use data from the Early Childhood Longitudinal Study – Kindergarten cohort (ECLS-k). I begin by comparing the characteristics of diagnosed and all other non-diagnosed children to document disparities in the distribution of diagnoses across social groups. Then I re-analyze the data through the illness career framework focusing on the social process, whereby three stages of the illness career are examined: 1.) whether or not parents were concerned about their children's mental health, 2.) whether or not parents had their children evaluated for a mental health problem, and finally, 3.) whether or not children were diagnosed with a mental health problem. At each stage, I estimate the association between social class, race/ethnicity, and the likelihood of transition to the next stage.

In line with other contemporary research, I find that white and middle class children (i.e., children with more educated parents) are disproportionately represented among those diagnosed with internalizing (e.g., depression, anxiety) and externalizing (e.g., ADD, ADHD, etc.) disorders compared to all of their non-diagnosed peers. However, using the illness career framework, I show that white and middle class children are more likely to have parents concerned with their children's mental health issues and,

in turn, be professionally evaluated. Net of their over-representation at these earlier stages, white and middle class children are no longer disproportionately diagnosed. That is, race/ethnicity and social class do not predict diagnosis status among children who were professionally evaluated. In short, white and middle class children appear more likely to be diagnosed compared to all their non-diagnosed peers because they are more likely to progress through the earlier stages of the illness career toward a diagnosis. These findings provide insight into the intersection of mental health and social inequality, as well as offer an alternative account of how differences emerge in the distribution of diagnoses in children.

Literature Review

Children, Mental Health, and Social Stratification

One of the most consistent findings over the last several decades has been the inverse association between social advantage and mental health symptoms, for both adults and children (Chen, Martin and Matthews 2006; Haas 2006; House et al. 1994; Kitigawa and Hauser 1973; Kozyrskyj et al. 2010; Miech et al. 2006; Syme and Berkman 1976). Children from disadvantaged families tend to display more depressive symptoms, have higher levels of aggressive behavior, and generally experience poorer mental health (Strully 2009). For example, McLeod and Nonnemaker (2000) showed that the more time children spent living in impoverished conditions, the higher their levels of emotional and behavioral problems, and other research has pointed to a decline in children's internalizing well-being related to drops in parents' annual earnings (Mendelson et al. 2008).

Moreover, the inverse association between social advantage and mental health is not just limited to social class, but has also been observed between historically more and less advantaged race and ethnic groups as well (e.g., Brown, Meadows and Elder 2007; Schmitz 2003). Specifically, African American, Hispanic, and other racial/ethnic minority children tend to display higher levels of hyperactivity, and exhibit more antisocial and disruptive behavior (Schmitz 2003; Strohschein 2005). Additionally, mental health problems may be particularly severe for minorities living in impoverished conditions (McLeod and Owens 2004).

Based on the distribution of mental health symptoms, it might be expected that working-class/poor and racial/ethnic minority children would also be over-represented among those diagnosed. Indeed, Wagner, Cameto, and Newman (2003) used data from the second National Longitudinal Transition Study and found that fewer than 35 percent of children with an emotional disorder were from families earning over $50,000, whereas more than 55 percent of children in the general population of students came from such families. Further, it might be expected that once differences in children's mental health symptoms are considered there would no longer be an association between social advantage and diagnoses (e.g., Visser, Leasesne and Perou 2007). Yet, increasingly there is evidence of another trend wherein advantage is associated with an increased likelihood of diagnosis, especially for disorders such as ADD/ADHD and depression, and instead of disadvantaged children being overrepresented among the diagnosed, they are actually underrepresented.

New Trends in the Association between Social Background and Mental Health

Beginning in the late 1990s and early 2000s, reports began to surface in the popular and academic press that white and middle class children were overrepresented among individuals diagnosed with certain mental health problems like ADD/ADHD and learning disabilities. For instance, in 1999, Robert Worth published a piece in *The Washington Monthly*, which detailed the different experiences of working and middle class families in obtaining special education services for their children with mental health problems. According to Worth, advantaged parents more easily secured diagnoses and services for their children irrespective of children's needs, and Worth argued that certain diagnoses, like learning disabilities, were "often little more than an expression of class bias" (Worth 1999, pg. 5). Similarly, in a story from 2000, CNN reported that children of poor families were more likely to be under-diagnosed for mental health disorders, because "teachers, doctors, parents and other care-givers for middle-class children [were] more sensitive to the disorder and… more likely to refer children for evaluations" (CNN 2000).

In addition to these reports, academic studies also started showing this unexpected pattern between social advantage and children's mental health diagnoses. Some researchers interviewed psychiatrists, using vignette study designs to provide hypothetical patient-cases in which children's race and social-class was varied. Such studies showed that psychiatrists were more likely to assign a diagnosis to white and advantaged children than racial/ethnic minority and disadvantaged individuals (Loring and Powell 1988; Pottick et al. 2007). Other research has drawn attention to the disagreement between the display of symptoms and the presence or absence of a

professionally-given diagnosis to show that white and middle class individuals were more likely to be diagnosed (e.g., Alegria and McGuire 2003). However, possibly the strongest evidence of the uneven distribution of mental health diagnoses across groups of children was provided by research using large-scale, sometimes nationally representative samples of children. For instance, LeFever, Dawson, and Morrow (1999), after examining the prevalence and distribution of ADD/ADHD diagnoses and medication use in a school district in southeastern Virginia, found that white children were more likely to be diagnosed and receiving medication than African American or other minority children. Similarly, Schneider and Eisenberg (2006) used data from the Early Childhood Longitudinal Study – Kindergarten cohort to document the disproportionate number of white children diagnosed with ADHD relative to their minority peers, net of children's externalizing behaviors. Additionally, Pastor and Reuben (2005) used data from the National Health Interview Study and showed that children from families with higher annual incomes were more likely to be diagnosed with ADHD.

Much contemporary research thus suggests that social advantage is positively associated with certain mental health diagnoses, such as ADD/ADHD and depression. Accordingly, the seeming contradiction between the elevated levels of mental health symptoms and lower rates of mental health diagnoses among disadvantaged children has raised concern about the ability of current diagnostic instruments to assess their mental health (Alegria and McGuire 2003; Pottick et al. 2007), prompting new calls for mental health professionals to develop culturally specific and sensitive criteria for identifying and evaluating mental health problems (Snowden 2003). It is of course important that diversity and multicultural differences be incorporated when needed; however, before

revising diagnostic tools, it is essential to first establish that the uneven distribution of diagnoses among groups represents cultural bias or inadequacy in the diagnostic tools or opinions of mental health professionals. Indeed, I will propose an alternative explanation that accounts for the seeming uneven distribution of mental health diagnoses across groups by considering the social process preceding the diagnosis.

Symptoms do not always universally link with diagnoses because social context "distinguishes disordered or dysfunctional responses from normal ones" (Kirmayer and Young 1999, pg. 450). Yet, the conceptual framework underlying most current research on health inequalities does not fully consider the role of social process. The majority of studies rely upon what I will refer to as the "traditional framework" of mental health stratification research: the characteristics of diagnosed individuals are compared to the characteristics of *all* non-diagnosed individuals. The issue with the traditional framework is that not *all* individuals are at risk of being diagnosed with a mental health problem. That is, in order for individuals to be diagnosed, they must first be professionally evaluated, and in order for an individual to be professionally evaluated, they must first be concerned about their mental health well-being. Thus, children diagnosed with mental health problems arrive at the diagnosis after first passing through prerequisite stages, and during this social process the composition of individuals eventually diagnosed is importantly altered. However, prior research on health inequality has typically overlooked this process when describing who gets diagnosed; thus, missing the point which is the focus of this study: white and middle class children are over-represented among the diagnosed because they are more likely to progress through the social process toward a diagnosis.

Reconceptualizing Current Research

In making explicit the social process, I propose an alternative conceptual model of health stratification, which draws on the "illness career" framework to explore the distribution of children's mental health diagnoses (Pescosolido and Boyer 1999). An illness career framework describes the multiple stages through which an individual must traverse toward an eventual diagnosis. Importantly, this framework assumes that an individuals' experience of symptoms contributes to the likelihood of progressing to subsequent stages; however, it also recognizes that social factors, such as race/ethnicity and social class, significantly condition the eventual outcome.

Typically, the illness career framework has been used to study adults, but since the focus here is on children, the original illness career framing needs to be revised slightly. In particular, the hypothetical actor in the original depiction of the illness career possesses many adult qualities that are not as prevalent among children. As described in Pescosolido, Boyer, and Lubell (1999):

> "The illness career begins with the onset of symptoms. In the first stage…the sick person evaluate[s] 'generalized objective criteria,' weighing the severity of a problem, the prognosis, the frequency of its occurrence and normal 'well-role' expectations… [I]ndividuals who rationally and scientifically evaluate their circumstances, make a claim to those around them in the community, and proceed either to enter the sick role or return to normal roles… At this stage…called 'the decision to seek professional advice,' the 'gatekeepers' are physicians who legitimate only 'true' claims of illness…" (pg. 443).

Although this description of the illness career has been critiqued as an oversimplified, ideal typical representation of the process, it makes apparent the complex and complicated decisions that must be navigated for an individual to identify and seek a diagnosis for mental illness (Furnham 1994; Horwitz 1982). Consequently, the

hypothetical actors in the illness career must possess relatively high levels of self-awareness to use "generalized objective criteria" in the evaluation of their own behavior and emotions relative to social norms. Children, especially young children in elementary and middle school, are still developing the ability for comparison with the generalized social others. Additionally, children lack the independent funds to "seek professional advice." Therefore, children's illness careers cannot be premised upon their own actions, but instead reflect the actions of parents (or guardians). In the adult illness career the "sick person…evaluates generalized objective criteria" to determine whether they "enter the sick role". For children's illness careers, parents are left to determine if the actions and behaviors of their children are acceptable (i.e., parental concern), and whether professional help is needed (i.e., professional evaluation) (Teagle 2002).

Employing a parent-centered illness career framework also allows for a more thorough examination of how social class and race/ethnicity contribute to the distribution of diagnoses across groups of children. Differences in the distribution of diagnoses may be shaped early in the process if white and middle class children are more likely to experience parental concern. The overrepresentation of advantaged children among the diagnosed could also arise at other stages, that is, if working-class/poor and minority children are less likely to be professionally evaluated; or if evaluated, disadvantaged children are less likely to be diagnosed. The use of the illness career framework then, provides an expanded conceptualization for understanding health inequality and identifying the emergence of disparities in children's mental health diagnoses.

Still, why might white and middle class children be more likely to have parents concerned about their mental health? Or, why might certain children be more likely to be

professionally evaluated? These questions are important and represent areas in which the illness career framework continues to identify elements of health inequality. A possibility, given that parents primarily direct their children's illness careers, it is that certain parent qualities influence the likelihood that children will transition toward a diagnosis. Earlier research has documented that parents' cultural practices are associated with better health, as "high-culture" activities create a greater awareness and appreciation of pristine health (Kickbusch 2001). Further, access to healthcare is sometimes contingent upon available financial resources, and children with parents who earn more may have access to the disposable income needed to pay for visits to mental health professionals that might not otherwise be available (Gaskin, Kouzis and Richard 2008). Thus, children's progression through stages of the illness career could partially reflect their family's cultural and financial resources.

The definition of cultural resources varies across study, ranging from high culture engagement (DiMaggio 1982) to cultural capital and parenting practices (Lareau 2003), to habitus and parental educational expectations (Dumais 2002). In general, cultural resources refer to parents' practices and family processes that cultivate children to think, act, and interact according to particular norms. Linda Blum (2007) provides ethnographic evidence of the importance that cultural resources, in particular parenting practices, have in the lives of children with disabilities. In her study, Blum interviewed parents of children diagnosed with "invisible disabilities," such as mental health problems, and incorporated previous work on class-based parenting practices and concerted cultivation (Lareau 2003) to demonstrate the intensive and active parenting required to successfully navigate children's mental health issues. For instance, parents

had to interact with numerous institutions in order to secure a diagnosis, as this story from a mother attempting to have her son [Robert] evaluated demonstrates:

> "The therapist suggested testing [to obtain a diagnosis for Robert]…So I call [the specialty clinic], 'Well, you need to get approved from the insurance company.' …I called the insurance company…they give me this one-page form for justification. I said, 'All right, it looks pretty straightforward.' So I said, 'Who needs to write this?' They said, 'Oh your therapist can do this.'…I'm waiting for the therapist to fill out this form…[after eight weeks] I'm yelling at the therapist…[Finally] we get it to the insurance company… They deny it because they think my son needs to see a psychiatrist…[After filing an appeal, stalled in lengthy steps,] … I started calling all these psychiatrists and no one would call me back…" (Blum 2007, pg. 214).

Additionally, mothers were often forced to single-handedly manage their children's schooling, consult with educational advocates, and self-prepare education plans to present to their children's teachers. For Blum, the efforts of these mothers paralleled the type of active parenting described by Annette Lareau (2003), in her account of middle-class parenting strategies.[1] Other research documents the necessity of active mothering in the lives of children with disabilities as well (Ryan and Runswick-Cole 2008; van Hove et al. 2009). The common implication is that children whose parents are more active in their schooling or more entrenched in an expansive network of personal and professional connections may more easily progress through the stages of the illness career.

Blum's work also provides evidence that financial resources may be related to children's progression through the illness career. Many of the mothers in Blum's study

[1] Blum did not observe a class-based difference in the parenting strategies of the mothers contained in her sample, however the practices she described are more closely aligned with the practices of the middle class according to prior research (Lareau 2003). Additionally, it should be noted that the "middle class" parenting strategies of the mothers in Blum's sample is not to suggest that somehow middle class parenting contributed to children's mental health problems, but rather given any problematic behavior (e.g., symptom displays) from children, the resources and practices of middle class parents would be expected to increase the likelihood of a child progressing through the stages toward a diagnosis.

were forced to hire educational advocates, pay for private therapy and evaluations, as well as take time off of work to care for their disabled children. Although parents from across the class spectrum can perform these tasks, they are made easier by middle class circumstances. For example, one mother recalled the costs associated with getting her son [Brandon] diagnosed: "Brandon, he needed an evaluation. But pursuing that through normal [school] channels, there was a six- to eight-month wait. So I went ahead and just booked it at St. Joseph's… It's from three to five thousand dollars. . . " (Blum 2007, pp. 212-213). Financial resources make available to parents opportunities that would not otherwise exist; therefore, certain children may be more likely to progress toward a diagnosis because they have access to financial resources that make it easier to do so.

To summarize, by applying the illness career framework to the study of children's mental health, it is possible to better understand the unequal distribution of mental health diagnoses between social groups. This framework reconceptualizes disparities in diagnoses as emerging from a process in which advantaged children have a greater propensity to transition through stages of the career and eventually become diagnosed. Thus, as I will detail, compared to all non-diagnosed children, individuals with mental health diagnoses are disproportionately white and middle class, but analyzed within the context of the social process associated with diagnosis, race/ethnicity and social class no longer differentiate between diagnosed and non-diagnosed individuals. This parity emerges because white children and those from more advantaged family backgrounds are more likely to progress through the earlier stages of the illness career. Consequently, the illness career framework distinctly illuminates the process through which social inequality shapes the distribution of children's mental health diagnoses.

DATA AND METHODS

Data

Data for the analysis come from the restricted-license data file of the Early Childhood Longitudinal Study – Kindergarten cohort (ECLS-k). Funded by the National Center for Education Statistics, the ECLS-k is a seven-wave panel study that collected data on more than 20,000 children during their Kindergarten year in the Fall of 1998 and followed them until Spring 2007 (Tourangeau et al. 2006). The sample was originally designed as a three-stage stratified random sample, with students nested in schools, which were nested in counties. Data were collected from children, as well as their parent, teacher, and school administrator to provide several perspectives on children's family and educational circumstances.

In addition to the use of multiple informants, the ECLS-k collected data on several dimensions of children's lives, such as physical development (e.g., height and weight), family environment (e.g., annual income, parenting practices, material resources), academic achievement (e.g., math, reading, and general knowledge/science assessments), and children's health. As part of the health data, information was gathered about children's disabilities, both physical (e.g., visual, hearing, and speech) and mental (e.g., learning, activity, and emotional).

Variables

Table 1 displays the descriptive statistics of the covariates for the overall sample, as well as specifically for children diagnosed with an internalizing or externalizing problem. For reference, I also provide the descriptive statistics for a group of children

who were never evaluated nor diagnosed with a mental health problem during any wave of the study (n ~ 2,230).

Children's Mental Health Outcomes

When studying children's mental health, it is possible to identify very specific conditions (e.g., depression or ADHD) or very broad categories (e.g., internalizing and externalizing problems). The shortcoming of broad categories is the loss of specificity; however, studies focused on a single mental health outcome can sometimes miss patterns and processes that apply to different types of mental illnesses. With these data, attempting to focus on specific mental health problems (e.g., ADHD or depression) would lead to prohibitively small sample sizes. Also, questions about stages of the illness career (i.e., parental concern and professional evaluations) were not asked about specific mental health problems (e.g., depression), but about broad categories (e.g., emotional problems). It is thus unclear what specific mental health problem initiated parental concern or a professional evaluation for children who were not eventually diagnosed. Therefore, I relied upon more general categories of mental health, and explored children's internalizing and externalizing diagnoses.

Internalizing diagnoses are based on children's emotional disorders. For children eventually diagnosed with an internalizing problem, typical diagnoses were depression, anxiety, obsessive-compulsive disorder, or bipolar disorder (discussed in more detail below). The measure of internalizing diagnoses closely resembles the definitions used by prior research (Miech et al. 1999; Strohschein 2005).

Typically externalizing mental health problems refer to diagnoses, such as conduct disorder, oppositional defiance disorder (ODD), or ADHD (Carter et al. 2010;

Dohrenwend et al. 1992); however, in the ECLS-k, these disorders were not classified under a single heading. Instead, different types of externalizing problems were identified under three categories: learning disorders, activity problems, and behavior problems. For example, the majority of children diagnosed with ADD/ADHD were originally evaluated for a learning disorder.[2] Activity problems and behavior problems included ADD/ADHD diagnoses as well, in addition to ODD and CD. Therefore, responses to the three categories were combined to create the measure of externalizing diagnoses (discussed in more detail below).[3]

Traditional framework versus Illness Career. For the traditional framework model, I coded internalizing and externalizing *diagnosis* as 1 for children who were diagnosed and as 0 for all other non-diagnosed individuals with valid records for each wave (i.e., if children were non-diagnosed and had valid measures for grade 3, then they were coded as 0 for the grade 3 wave). For the illness career models, I identified three stages for the analysis (in order): parental concern of their children's mental health, professional evaluation for a mental health problem, and professional diagnosis of a mental illness (henceforth, referred to as "parental concern", "professional evaluation", and "professional diagnosis") (Andersen 1995; Pescosolido, Boyer and Lubell 1999).[4] The measure of *parental concern* was based on parents' responses to the following

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[2] Additionally, the majority of children evaluated for a learning disability were diagnosed with ADD/ADHD.

[3] Alternative definitions of externalizing problems were also examined, specifically including only children from the learning disorder group without substantively altering the results. It was not possible to examine activity problems and behavioral problems separately, because too few children were in these categories.

[4] Without being certain of the timing of parental concern and professional evaluation, a longitudinal analysis is not possible because the timing is the same for all three "events" (i.e., parental concern, professional evaluation, and professional diagnosis). Additionally, were all five waves of data to be pooled for a single analysis, the results would blur any wave-specific effects without including numerous interaction terms. Consequently, the decision was made to conduct a wave-specific analysis.

question: "Do you have any concerns about [CHILD]'s overall emotional behavior, such as anxiety or depression?"[5] If a parent reported concern about the child's well-being, then the child was given a score of 1 and a 0 otherwise. The measure for *professional evaluation* is based on parents' responses to the question: "Has [CHILD] been evaluated by a professional in response to [his/her] overall emotional behavior?" Again, if a parent reported that the child had been evaluated, then the child received a value of 1. Finally, the measure of *professional diagnosis* was based on parent responses to the question: "Did you obtain a diagnosis of a problem from a professional?" Affirmative responses were coded as a 1.

Importantly, only those children responding "yes" transitioned to the next stage, and a value of 0 was only given to children with a valid "no" response to each prior stage of the illness career. Consequently, the model predicting parental concern of children's internalizing problems in the third grade wave has ~11,370 valid responses, the model predicting children's professional evaluations for an internalizing problem in the third grade has ~1,410 valid responses, and the model predicting children's professional diagnoses for an internalizing problem in the third grade has ~530 valid responses (for discussion of transition modeling, see Mare 1980; Mare 1981).[6]

Mental Health Symptoms. To understand who gets diagnosed, it is essential to consider mental health symptoms, even though symptoms do not automatically translate

[5] This question was specifically used to measure parental concern for children's internalizing problems. Identical questions were asked of parents regarding children's learning problems, activity problems, and behavior problems, and responses to those measures were used for the externalizing problem models. Similarly, for professional evaluation and professional diagnosis, identical questions were asked about children's learning, activity, and behavior problems, and responses were used to create the measures for the externalizing problem models.

[6] I am required in my agreement the National Center for Education Statistics to round all reports of my data to the nearest 10s, because I am using the restricted use data file of the ECLS-k.

to diagnosis. In fact, some researchers estimate only 30 to 40 percent of individuals with symptoms severe enough to receive a professional diagnosis actually seek treatment (Froelich et al. 2007; Kessler and Walters 1998), while half of the individuals currently receiving treatment do not meet clinical criteria for a diagnosis (Robins and Reiger 1991). Despite the disconnect between symptoms and diagnosis, the two are importantly linked. Additionally, the associations between social class, race/ethnicity, and mental health diagnoses are premised upon the presence of symptoms. Indeed, the illness career assumes the existence of symptoms, while allowing for other factors to independently contribute to children's likelihood to progress through stages. Symptoms serve as a baseline for understanding social inequality in mental health, because the issue of unequal outcomes hinges on the idea that, controlling for mental health symptoms, certain children are more or less likely to transition across the stages of the illness career.

Measures of mental health symptoms include children's *internalizing* and *externalizing* well-being, which are based on teacher and child reports.[7] The scales originally provided in the ECLS-k were coded to measure children's internalizing problems (e.g., child is sad or lonely) and externalizing problems (e.g., child is impulsive or quick tempered).[8] To compute the measure used in the analysis, I reverse coded the variables such that a higher score indicated better mental health, and then averaged the child and teacher scores together (for precedent in this technique, see Potter 2010). In addition to internalizing and externalizing well-being, I also control for children's

[7] In other waves, different informants were used to construct these measures: grade 5 – teacher and child, grade 8 – parent and child.

[8] The ECLS-k user's manual describes the index construction process, and reports that each index had relatively high internal validity ($\alpha > 0.70$) (for discussion of index construction, see Tourangeau et al., 2006, Chapter 3, pp. 38-42).

attentiveness, which may be particularly important given the presence of ADD/ADHD diagnoses among the externalizing disorders. Attentiveness was based on teachers' evaluations of students' approaches to learning, which was coded by ECLS-k programmers so that higher scores indicated better attention and schooling motivation.

Indicators of Social Advantage. I considered two indicators of social advantage: social class and race/ethnicity. As a proxy of social class I relied on a frequently used indicator of social advantage and family background: parental educational attainment. *Parents' educational attainment* was derived from parent reports of their highest level of schooling completed divided into three categories: high school diploma or less (reference group), some college experience, and a bachelor's degree or more.[9] Categorical representation of parent's educational attainment are used instead of a continuous measure, such as years of education, because of potential non-linear associations.

Race/ethnicity is measured using the composite variable from the ECLS-k. The original variable had eight categories, which was reduced to three for the analysis: white (reference group), African American, and Hispanic. Attempts were made to include more groups (e.g., Asian, Native American, etc.), but not enough children in the other categories were diagnosed with a mental health problem to allow for reliable estimates of coefficients. Generating an encompassing "other" category from the remaining children led to an indistinguishable and ill-defined collection of individuals. Children from other race and ethnic groups are therefore dropped from the analysis.

[9] Alternative groupings of parent's education were attempted (e.g., separating bachelor's degree only from post-graduate work) without altering the findings.

Cultural and Financial Resources. Cultural and financial resources may contribute to children from certain groups transitioning across stages of the illness career toward mental health diagnoses. Thus, I included several indicators of cultural and financial resources. Cultural resources were measured using several variables that prior research has identified as important for capturing the transmission of advantage across generations. In particular, I included measures of parent-child interactions, child activities, parental school involvement, parent-to-parent communication, parental educational expectations, and family routines.

Parent-child activities is based upon parent-report of how often parents do certain activities with their children, such as play games, talk about nature, build things, play sports, and make art.[10] Scores were averaged together to create the variable used in the analysis. The measure of *child's activities* is based on children's participation in extra-curricular, leisure time activities. Parents were asked if their child participated in six activities (dance, music lessons, athletic team, performance group, organized club, or arts and crafts), and participation was coded as 1 and non-participation as 0. Responses were then summed together, so that the variable could take on a value between 0 and 6.[11]

Parental school involvement is a measure of the extent to which parents were involved with their child's school. In total, seven questions were used to create the count

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[10] In the eighth grade wave, the collection of parent-child activities was different to reflect more "age-appropriate" tasks, such as working on a hobby together, go shopping, go to restaurant, talk together, and watch TV together, however they were coded the same in the ECLS-k, and thus treated similarly in the analysis. Correlation comparisons with prior waves revealed the 8th grade measures to be moderately associated with the parent-child measures from previous waves.

[11] Again, in the eighth grade wave, the questions asked of children's activities were changed to reflect age-appropriate extracurricular engagement, such as school club, school sports team, school drama, arts and crafts class, non-school sports, or organized club. Although the mean level of activity participation increased between grade 5 and grade 8, the eighth grade activity level was moderately associated with the activity level of children from prior waves.

variable (parental school involvement items: contacted school, parent-teacher conference, open house, PTA meeting, volunteered at school, attend school event, and fundraising efforts). Answers to these seven questions were dichotomous (1 = yes, 0 = no), and added together to create a variable with values between 0 and 7.[12] *Parent-to-parent communication* is based on parent reports of the number of their child's friends' parents they know.

Parental educational expectations was based on parent-reports of how much schooling they expect their children to receive. Parents expecting their children to receive a bachelor's degree or more were coded as a 1 and all other responses as 0. *Family routines* is a count measure based on the consistency of certain activities in children's households; specifically, whether children ate breakfast at the same time five or more days a week, ate breakfast as a family five or more days a week, ate dinner at the same time five or more days a week, ate dinner as a family five or more days a week, and went to bed at a regular time. Affirmative responses were coded as 1, and then summed together so that the variable's values ranged from 0 to 5.

In order to account for children's financial resources I included measures of family income, private health insurance, and regular doctor visits. *Family income* was coded into four groups: <$20,000 (reference), $20-45,000, $45-70,000, and >$70,000. A categorical measure of income was used instead of a continuous measure to capture non-

[12] For the eighth grade wave parents were given a third option of "no opportunity yet." Any answer of "no opportunity yet" was recoded to reflect the probability of involvement based on parental responses in prior survey years. Responses were then added together, so that the variable could take on a value between 0 and 7.

linear trends in the associations.[13] *Private health insurance* was a dichotomous measure indicating if children were covered by a private plan; if so they were given a value of 1, and otherwise a value of 0. Finally, *doctor visit* is a dummy variable indicating if children went to the doctor for a regular check-up in the past year (1 = yes).

Additional Covariates In addition to the independent variables of interest, I include controls for children's gender, age, family structure, urbanicity, and region. *Gender* is included because of the disproportionate representation of boys with mental health diagnoses, especially for externalizing disorders like ADHD (e.g., Ohan and Visser 2009). Consequently, an indicator variable is included for gender (1 = *female*). Additionally, age is included as an interval measure (in months) in order to provide a proxy for children's overall developmental level. *Two-biological parents* is a measure indicating if there were two biological parents in the household (1 = yes). *Urbanicity* is a set of dummy variables indicating if the child lived in the city, suburbs, or a rural area (reference group). Finally, *region* measured the part of the country in which children resided, using a set of dummy variables for northeast, Midwest, south, and west (reference group).

Missing Values

Missing values for the covariates were dealt with using multiple imputation via the ICE command (Royston 2007) in STATA. Although other software packages are able to perform multiple imputation, STATA was used because it allows the user to specify the model type for the imputation analysis. To insure that certain variables took

[13] Alternative divisions of family income were tested, including testing quintiles and quartiles, without altering the substantive significance of the findings reported herein.

only positive values during the imputation process (e.g., age), the natural log of all non-negative interval variables was used for imputing, and then exponentiated to original scale for analysis. A total of five data sets were imputed.

Method

To model the outcomes in this project, I used logistic regression analyses to estimate the likelihood of parental concern, professional evaluation, and professional diagnosis. I also used a Taylor linearization weighting strategy to adjust for the clustering of data in the original sampling design, as well as the oversampling of certain minority groups (Hispanics). Additionally, supplemental y-standardized models were run, and are reported in Appendix A.[14] All analyses were performed in STATA. The full model is presented below:

$$\text{logit}\,(p_i) = \alpha_0 + \beta_1\,\text{SYMP}_i + \Sigma\beta_2\,\text{RACE}_i + \Sigma\beta_3\,\text{PARENTAL EDUC}_i + \Sigma\beta_4\,\text{CULTURAL}_i + \Sigma\beta_5\,\text{FINANCIAL}_i + \Sigma\beta_6\,X_i,$$

where (p_i) is the odds that child *i* will be diagnosed in the traditional framework model, and the odds that child *i* will experience parental concern, be professionally evaluated, or have a professional diagnosis in the illness career models. Separate models were run predicting internalizing and externalizing diagnoses. SYMP is a vector of variables measuring children's symptoms (e.g., internalizing, externalizing, and

[14] Since part of this analysis involves entering variables sequentially to see the changes to the social class and race/ethnicity coefficients, it is important to refer to the y-standardized models. In logistic regression models, unlike OLS regression models, the variance of the dependent variable changes as additional covariates are included in the model. Thus, estimated coefficients for the independent variables in the model are altered with the inclusion of new variables. Consequently, when comparing across models in which variables are added in a step-wise fashion, it is possible for a "false" mediation to occur. The inclusion of other covariates, such as cultural resources, might appear to explain the association between another variable and the dependent variable, such as the negative association between being African American and the likelihood of being professionally evaluated, when in fact the decline actually results from the change to the variance of the dependent variable. Y-standardized models adjust for this change in the variance of the dependent variable, and provide a more stable comparison across models.

attentiveness), PARENTAL EDUC is a vector of dummy variables for parent's educational attainment, and RACE is a vector of dummy variables for race/ethnic group membership. CULTURAL is a vector of measures for children's cultural resources (e.g., parent-child interaction, child activities, parental expectation, etc.), and FINANCIAL is a vector of measures for children's financial resources (e.g., family income, private insurance, doctor visits). X is a vector containing the additional covariates in the models (e.g., gender, age, urbanicity, etc.).

RESULTS

Separate analyses were conducted on data from grade 3, 5, and 8; however, for ease of presentation I only report results from grade 3. The general patterns in grades 5 and 8 conform to those observed in grade 3, and results from those waves are available from the author upon request. I divide the presentation of findings into two sections. In the first section, I provide a descriptive overview of the distribution of diagnoses across groups of children, and the different conclusions drawn using the traditional framework versus the illness career framework. In the second section, I return to the social class and race/ethnic gaps observed at earlier stages of the illness career and examine the usefulness of cultural and financial resources for understanding these disparities.

Distribution of Mental Health Diagnoses by Social Class and Race/ethnicity

Internalizing Diagnoses

Traditional Framework. Results of the logistic regression analysis predicting children's internalizing diagnoses are reported in Table 2.1. Model 1 reports the estimates for the association between race/ethnicity, social class, and diagnosis using the traditional framework, controlling for symptoms. When compared to all other non-

diagnosed children, diagnosed children appear more likely to be white and have more educated parents. Specifically, African American and Hispanic children had nearly 70 percent and 40 percent, respectively, lower odds of being diagnosed than white children, and the odds of being diagnosed for children whose parents had some college experience or more were nearly 40 percent higher than the odds of children whose parents had only a high school diploma or less. Thus, in line with other contemporary research, the results of the traditional framework model suggest that the advantaged are more likely to be diagnosed.

Illness Career Framework. In Table 2.1, Model 2 through Model 4 present the findings of analyses predicting children's progression across stages of the illness career toward a diagnosis for an internalizing problem. Model 2 reports the outcomes from parental concern. African American children had 40 percent lower odds and Hispanic children had nearly 20 percent lower odds of having a concerned parent than their white peers. In comparison, the odds of parental concern for children whose parents had a bachelor's degree or more were 26 percent higher than children whose parents had a high school diploma or less. Thus, the race/ethnicity and social class differences observed in the traditional framework are also present at the early stages of the illness career for children's internalizing dagnoses.

Model 3 reports the coefficients predicting professional evaluation, and of children whose parents expressed a concern, minority children were less likely to be evaluated. The odds that children would be professionally evaluated were 55 percent and 45 percent lower for African American and Hispanic children, respectively, relative to

white children with concerned parents. Level of parents' education was not statistically associated with professional evaluation.

In the final model, predicting professional diagnoses for children who were evaluated, neither social class nor race/ethnicity were related to diagnosis status. Moreover, the association between Hispanic group membership and diagnosis was trending positive (although non-significant), which is in the opposite direction of the association at previous stages. Thus, the evidence suggests that white and middle class children were *not* favored in the diagnosis of an internalizing problem once the social process for arriving at diagnosis is considered. The distribution of diagnoses observed in the traditional framework model appears to reflect the increased likelihood that white and middle class children will progress through earlier stages of the illness career.

Externalizing Diagnoses

Traditional Framework. Table 2.2 presents the results of the logistic regression analysis predicting mental health diagnoses of children's externalizing problems (e.g., ADD, ADHD, conduct, oppositional). Model 1 uses the traditional framework to show race/ethnic and social class disparities, and similar to model predicting internalizing diagnoses, white children and children with more educated parents were more likely to be diagnosed. The odds of diagnosis were 57 percent and 49 percent lower for African American and Hispanic children, respectively, compared to white children, net of parents' educational attainment. Additionally, the odds of diagnosis for children whose parents had a bachelor's degree or more were 33 percent higher than the odds for children whose parents had a high school diploma or less.

Illness career framework. In Table 2.2, Model 2 through Model 4 provide the estimated coefficients for each stage of the illness career for children's externalizing diagnoses. Model 2 reports the distribution of parental concern across race/ethnic and parental education groups, and shows that minority children were less likely to have a parent concerned about their externalizing behaviors. Specifically, African American and Hispanic children had 30 percent lower odds of having a concerned parent than their white counterparts, but there was no difference in parental concern across parents' education level.

Model 3 reports the distribution of professional evaluations across race/ethnicity and level of parents' education. Of children whose parents reported being concerned, the odds of professional evaluation were about 30 percent lower for African American and Hispanic children, respectively. In contrast, children whose parents had the most education had 30 percent higher odds of being professionally evaluated than children whose parents had a high school diploma or less. Thus, evidence of the pattern observed in the traditional framework is observed at earlier stages of the illness career for children's externalizing problems as well.

The final model reports the estimated coefficients predicting professional diagnoses among children who were evaluated for an externalizing mental health problem in the third grade (Model 4). Unlike the model for internalizing diagnoses, race and ethnicity continued to predict diagnosis status in the final model for externalizing diagnoses. African American children had 60 percent lower odds of professional diagnosis, and the odds of being diagnosed for Hispanic children were more than 40 percent lower than the odds of white children. Parents' educational attainment level was

not associated with diagnosis status. For externalizing problems in grade 3, there is still evidence that white children are over-represented among diagnosed individuals.

In general, the models using an illness career framework to predict children's internalizing and externalizing diagnoses provide evidence that part of the inequality in the distribution of diagnoses is the result of its preceding social process, especially with regards to gaps associated with social class. The apparent over-representation of children with more educated parents among the diagnosed in the traditional framework models appears to be a product of such children being more likely to have concerned parents and being more likely to be evaluated. Once this greater likelihood of progression through earlier stages of the illness career was taken into consideration, social class was no longer predictive of diagnosis. Evidence from the internalizing diagnoses models indicates that the unequal distribution of diagnoses among white children is also in part a reflection of the parents of these children being more concerned and being more likely to have their children professionally evaluated. Less definitive support of the importance of social process was found in the models for externalizing problems, in which African American and Hispanic children were still less likely to be diagnosed, even relative to their evaluated peers.

Nevertheless, the illness career framework provides additional insight into the process through which middle class children become over-represented, and offers evidence of race/ethnic differences at other stages of children's mental health treatment that would go unrecognized employing the traditional framework. The differing ability of the illness career framework to account for race/ethnic and social class gaps suggests that distinctive social processes may be involved in the generation of these health

inequalities. Moreover, within the illness career framework the race/ethnic and social class inequalities were not removed but shifted to earlier stages. The illness career thus contributes to a more complete understanding of health inequality, which investigates beyond the diagnosis and focuses on the process within which the diagnosis is embedded. In the next section, I examine whether differences in cultural and financial resources help account for these disparities.

Cultural and Financial Resources and Illness Career Inequalities

Parental Concern

Internalizing. Children from different race/ethnicities and locations in the social class structure were more or less likely to have a parent concerned about their internalizing well-being. Minorities were less likely than whites to have a parent concerned, while children whose parents were more educated were more likely to have a concerned parent (see Model 1, Table 3.1). In order to determine whether these differences were attributed to other factors related to social class and race/ethnicity, additional covariates were considered, including measures of cultural and financial resources. In Model 2, controls were included for gender, age, region, and urbanicity, and the gaps between all groups increased slightly, a pattern that was observed in the y-standardized models as well (see Appendix A, Table A1.1). Model 3 introduced cultural resource measures, and although several of these variables were related to parental concern, the gaps in concern between race/ethnic groups and social classes remained largely unchanged. Specifically, parental school involvement was associated with an increased likelihood of parental concern, while parent-child activities, parent-to-parent communication, and parental educational expectations were associated with a lower

likelihood. Model 4 excluded the measures of cultural resources and added the financial resource measures. The race/ethnic disparity in likelihood of parental concern remained largely unchanged, however, the social class gaps unexpectedly increased. Upon closer examination, the increase in the gap between parents' education levels appears to occur as a result of the negative relationship that family income has with parental concern.

Children in families that earned more than the lowest group (i.e., more than $20,000) were less likely to have concerned parents, yet these parents were likely to be more educated and parental educational attainment was positively associated with concern. This is somewhat counter-intuitive, since income and education tend to be strongly and positively related: the more education an individual has, the higher annual income the individual is likely to earn (and this is present in the ECLS-k data as well – result not shown). It is possible that education and income are capturing two differing dimensions of the association between social advantage and children's mental health diagnoses. Education may be measuring something about parents' receptiveness to new ideas, and therefore more educated parents may be more open to embracing mental health problems as a viable concern facing their children. In contrast, since all levels of income above the minimum are associated with a lower likelihood of concern, the negative association with income may be indicative of parents' concentration on their own circumstances. For parents earning the lower range of income ($20-45K), these individuals may be concerned with their limited funds, while parents at the upper end ($70+K) may be focused on maintaining their high paying jobs and not entirely aware of their children's mental health problems. Another interpretation is to focus on the higher levels of concern for parents earning the least annual income. It may be that due to the

impoverished living conditions experienced by members of this group, parents are encountering their own mental health problems (e.g., Dohrenwend et al. 1992; Miech et al. 1999), and because of this may be more concerned that their children are being similarly affected. The negative associations between income and parental concern may thus reflect an elevated level of awareness by parents in the lowest-income group.

Model 5 includes both the cultural and financial resource measures, and although several of these covariates continue to independently predict parental concern for internalizing problems, they do not collectively explain either the race/ethnic or social class gaps. Indeed, the gaps in the final model are larger than the gaps in the baseline model; again, this appears to primarily reflect the counter-intuitive relationship between parental educational attainment, family income, and parental concern. Presented findings indicate the white and more educated parents are more likely to be concerned about their children's internalizing problems, and the difference in concern is not explained by the factors considered in this study.

Externalizing. Table 3.2 reports the findings from the models examining parental concern for children's externalizing problems. In the baseline model, the only significant gap was between racial/ethnic groups and controlling for the additional covariates left these differences largely unchanged (see Model 2). Measures of cultural resources were included in Model 3, and these factors slightly reduced the African American and Hispanic coefficients, but also increased the gap between children with more and less educated parents. Here the increase in the size of the coefficients of parents' education level appears to be a consequence of the negative association between parent-child activities, educational expectations, and parental concern. More educated parents are

likely to engage in a type of parenting that entails more active engagement with their children, and more educated parents are also more likely to expect their children to complete more schooling. Parents' educational attainment is thus positively associated with both these variables, and yet these variables are both negatively associated with parental concern of children's externalizing mental health problems. It may be that the increased time parents spend with their children makes them more accustomed to seemingly objectionable behaviors, thus reducing the likelihood of parental concern. Additionally, parents that expect their children to attain a lot of schooling may be reluctant to report concern about their children's mental health because such concern does not align with the vision they have of their children's future. In either situation, the parenting practices and educational expectations typical of more educated parents appear to reduce the odds of parental concern, which reveals a positive association between parents' education and parental concern.

The fourth model removed the cultural resource measures and included the indicators of children's financial resources. Again, family income was negatively associated with parental concern; however, unlike the internalizing models the coefficients associated with parents' educational attainment remained largely unchanged relative to Model 1. Finally, Model 5 included both cultural and financial resource measures. The difference in the likelihood of parental concern between white and minority children was slightly reduced; however, the gaps across parents' education levels increased and were statistically significant. Similar patterns were observed in the y-standardized models. Thus, cultural and financial resources do not appear to account for the differences in parental concern between race/ethnicity or social class for either

internalizing or externalizing problems. Further research is needed to better understand the factors predicting this initial stage of the illness career. Next, I turn to the race/ethnic and social class gaps in the likelihood of professional evaluation.

Professional Evaluation

Internalizing. Table 4.1 reports the findings for the models estimating the likelihood that a child is professionally evaluated for an internalizing mental health problem. In the baseline model, minority children were less likely to be evaluated than white children; however, there was no difference across levels of parents' education. Once the additional covariates were included (Model 2), the race/ethnic gaps remained; however, there was a marginal increase in the coefficients associated with parents' education, such that children with more educated parents were more likely be evaluated. Specifically, children whose parents had some college experience were 38 percent more likely to be professionally evaluated, and children whose parents had a bachelor's degree or more were nearly 20 percent more likely to be evaluated (relative to children whose parents had a high school diploma or less), but only the coefficient for "some college experience" approached significance.

Model 3 included the measures of cultural resources. The difference between white and Hispanic children was moderately reduced (still statistically significant), while the gap associated with parents' education was reduced to statistical non-significance. Controlling for only financial resources revealed a similar pattern, although the difference in the odds of evaluation between black and white children was slightly reduced (see Model 4). Interestingly, family income was not independently related to professional evaluation; however, the association trended positive. In particular, the coefficient for

the variable indicating that parents earn $70,000 or more, suggests that once parents are concerned about their children's mental health, income can serve as a resource that increases the likelihood of professional evaluation.

In the final model controlling for both cultural and financial resources, the differences in the likelihood of professional evaluation between white and minority children were reduced slightly (although remaining statistically significant), and the gap between levels of parents' education was reduced to statistical non-significance. A similarly large reduction in the coefficient for parents' educational attainment was observed in the y-standardized models (see Appendix A, Table A1.2). Thus, there is evidence to suggest that gaps in the likelihood of professional evaluation associated with social class may be accounted for by differences in the cultural and financial resources available to children (and families). Comparatively, cultural and financial resources did not explain as much of the difference between white and minority children, as African Americans and Hispanics were still less likely to be evaluated.

Externalizing. The baseline model reports the now familiar pattern wherein minority children were less likely to be evaluated, and children with more educated parents were more likely to be evaluated (see Model 1, Table 4.2). After controlling for additional covariates (e.g., gender, age, region), these patterns remained, although the white-Hispanic gap was reduced to marginal significance. Model 3 included the measures of cultural resources. Two of these measures were associated with evaluation: parent-child activities was associated with an increased likelihood that children would be evaluated, and parental educational expectations was associated with a decrease in the

likelihood.[15] Controlling for cultural resources reduced the white-Hispanic gap to statistical non-significance, and reduced the association between parents' education level to non-significant (although the substantive change in the latter coefficient is debatable). Model 4 included financial resources, and the only variable significantly related with evaluation was doctor visits. Once again, family income was trending positive suggesting that if parents were concerned with their children's mental health, income served as a resource that generally increased the likelihood of evaluation; however, none of the income coefficients were significant. The coefficients for race/ethnicity and parental education level were slightly reduced in Model 4 (relative to Model 2), and the Hispanic and "bachelor's degree or more" coefficients were no longer statistically significant. It is important to again note that the substantive change in these coefficients was relatively small (confirmed by similar changes in the coefficients of the y-standardized models, see Table A1.2).

The final model controlled for cultural and financial resources together. The gap between Hispanic and white children was reduced by 30 percent relative to Model 2, and was no longer statistically significant. A similar decline of 30 percent in the white-Hispanic gap for professional evaluation was also observed in the y-standardized model (see Table A1.2). The gap between children with the most and least educated parents was also reduced to statistical non-significance, but here the substantive reduction was not as large. Still, the general trends indicate that cultural and financial resources account

[15] The association between parent-child activities and children's mental health outcomes thus changes direction from the models predicting parent concern to the models predicting professional evaluation. Although more time parents spend with their children may increase their threshold for not expressing concern, once that threshold is breeched the interactions may serve as an ongoing reminder of their child's behavior thus increasing the likelihood of evaluation.

for a portion of the higher likelihood that middle class children were evaluated for an externalizing problem.

In contrast, African American children continued to have a lower likelihood of evaluation. These results from the externalizing models can be combined with the evidence from the internalizing models to suggest that African American children are less likely to be evaluated regardless of cultural or financial resources. Prior research has suggested that minorities, particularly African Americans, are less trusting of the medical establishment (Schnittker 2003; Vega and Rumbaut 1991); therefore, the lower likelihood of evaluation observed in this study may reflect differences in the cultural preference for medical treatment, a measure not captured in the data.

Discussion

Most prior research has shown that mental health problems and markers of social status are inversely associated, as white and middle class children tend to have fewer problems and better overall mental health (McLeod and Nonnemaker 2000; McLeod and Owens 2004; Strohschein 2005). This research has largely examined mental health symptoms, and recent studies focused more specifically on mental health diagnoses have found evidence contrary to the typical inverse association. Specifically, there are several studies suggesting that white and middle class children are over-represented among individuals diagnosed with particular mental health problems, such as ADD, ADHD, depression, and anxiety. Some researchers have used these disparities in diagnosis to argue that mental health evaluation criteria are culturally biased and insensitive to the mental health problems of minorities and disadvantaged children. In this study, an alternative explanation is proposed in which the unequal distribution of mental health

diagnoses is understood as the product of children's likelihood to progress through stages of the illness career. In other words, white and middle class children may be more prevalent among the diagnosed (compared to all non-diagnosed children) because they are more likely to have parents concerned about their mental health, and conditional on concern, their parents are more likely to have them professionally evaluated. White and middle class children are thus more likely to be among the diagnosed because of their engagement with the social process preceding the diagnosis. This account neither confirms nor denies cultural bias within the evaluation, but offers an alternative lens through which to examine inequalities in children's mental health.

Overall, the presented findings indicate that the illness career provides several insights into the emergence of racial/ethnic and social class inequalities in children's mental health diagnoses. In contrast with the traditional framework models, which showed that white and middle class children were over-represented among the diagnosed, the illness career models demonstrate that race/ethnicity and social class are related to parental concern and professional evaluation, which gives rise to their presence among the diagnosed. However, among evaluated children, race/ethnicity and social class did not differentiate between diagnosed and non-diagnosed children. This pattern was most strongly observed in the models for internalizing problems, and for gaps associated with social class. African American and Hispanic children, however, were still less likely to be diagnosed even when compared to their evaluated peers for an externalizing problem. Despite evidence continuing to suggest an uneven distribution of mental health diagnoses among race/ethnic groups, the illness career framework still provided additional insight into health inequality by identifying gaps at earlier stages of the career. Racial/ethnic

minority children were less likely to have a parent concerned about their externalizing problems, and were less likely to be evaluated for an externalizing problem. Thus, although the illness career framework does not account for all differences in distribution of diagnoses across groups of children, it fully accounts for many of these differences and partially accounts for most others.

Differences in children's cultural and financial resources did not account for race/ethnic and social class gaps in the likelihood of parental concern. Alternatively, cultural and financial resources explained part of the gaps in the likelihood of professional evaluations, but again, the clarity of the association was much more obvious in the models for internalizing problems than in the models for externalizing problems. Future research is needed to continue to examine additional correlates of parental concern and professional evaluation to better understand the factors that contribute to children's mental health inequalities at the earlier stage of the illness career.

Race/ethnicity and social class were also most often statistically significant predictors during stages in which children, or more importantly, their parents had the most control. For instance, parental concern is a condition that can surely be influenced by larger family, neighborhood/community, and group subculture factors. Children's mental health symptoms are likely to influence parental concern, but in the end, parents become concerned or not. Similarly, children's symptoms are likely to influence parents' decisions to seek a professional evaluation, but in the end parents decide whether to have their child evaluated. In contrast, the parent has very little control during the diagnosis stage, as the decision for diagnosis is given to the professional conducting the evaluation. Prior research has accused such professionals of bias in their application of evaluation

criteria, but here I find that race/ethnicity and social class are largely unrelated to diagnosis among evaluated children.

Finally, although I have focused on the process through which white and middle class children are more likely to progress through the stages of the illness career, it should not be inferred that the illness career framework implies that white or middle class parents are manipulating the system in their favor. The patterns and associations observed in this analysis were conditional on children's mental health symptoms. Thus, the greater likelihood of white and middle class children to have concerned parents or to be professionally evaluated begins with children first exhibiting mental health problems. A more appropriate interpretation of these findings therefore is that, given a particular level of children's mental health well-being, white and middle class parents are more sensitive to these problems and more likely to respond. Such a conclusion differs drastically from claims that white and middle class parents are over-using the mental health system to secure diagnoses for their children *regardless* of mental health need.

Future research would benefit our understanding of health inequalities by continuing to examine more closely the stages of the illness career, and how this process varies across different types of mental health outcomes. In particular, the presented findings are based upon analyses using broad categorizations of mental health problems (i.e., internalizing and externalizing diagnoses), which may have lost some of the nuance involved in the illness careers of specific disabilities, such as depression, ADHD, or social anxiety. Further, the use of parent-report variables for children's progression across the stages of the illness career, especially for professional evaluation and professional diagnosis, introduces a level of measurement uncertainty into the model that

can only be reduced with verification through medical records. Future research with verified accounts of children's involvement with professional mental health services may provide a different description of the distribution of evaluations and diagnoses.

The uneven distribution of diagnoses across race/ethnicity and social class observed in prior research using the traditional framework appears to result from children's likelihood of progressing through earlier stages of the career. Thus, efforts to make mental health evaluations more multi-culturally sensitive may fail to accomplish their goal of reducing diagnosis disparities, since based upon the findings reported herein, inequality in who gets diagnosed is generated prior to children ever meeting a professional. Results from this study indicate that interventions aimed at improving health equality must start in the family. The illness career framework thus provides an alternative conceptualization for understanding who gets diagnosed, and makes explicit how social advantage informs the process associated with children's internalizing and externalizing problems.

Table 1. Descriptive Statistics Oveall and by Diagnosis Status

	Overall (n ~ 11,600)		Internalizing Diagnosis (n ~ 760)		Externalizing Diagnosis (n ~ 320)		Non-evaluated/ non-diagnosed (n ~ 2,230)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Attentiveness	2.96	0.67	2.65	0.67	2.44	0.60	3.22	0.60
Internalizing Well-being	3.05	0.48	2.80	0.49	2.81	0.50	3.22	0.43
Externalizing Well-being	3.11	0.54	2.94	0.59	2.80	0.57	3.29	0.48
White	0.62		0.76		0.74		0.70	
African American	0.18		0.08		0.12		0.10	
Hispanic	0.21		0.16		0.14		0.20	
High school diploma or less	0.32		0.23		0.27		0.20	
Some college experience	0.35		0.40		0.38		0.34	
Bachelor's degree or more	0.33		0.36		0.36		0.46	
Female	0.48		0.40		0.30		0.50	
Age (in years)	9.22	0.38	9.23	0.38	9.22	0.41	9.21	0.35
Two biological parents	0.59		0.43		0.57		0.76	
City	0.35		0.29		0.27		0.33	
Suburbs	0.39		0.41		0.43		0.40	
Northeast	0.17		0.21		0.20		0.18	
Midwest	0.21		0.24		0.24		0.26	
West	0.20		0.20		0.14		0.21	
Parent-child activities	2.62	0.48	2.58	0.48	2.61	0.46	2.59	0.45
Child activities	1.52	1.28	1.55	1.25	1.43	1.18	1.76	1.29
Parental school involvement	4.75	1.61	5.18	1.52	4.90	1.52	5.06	1.49
Parent-to-parent	2.81	4.13	2.46	3.44	2.24	3.48	3.59	4.71
Educational expectations	0.75	0.42	0.64	0.48	0.60	0.49	0.84	0.36
Family Routine	3.70	1.01	3.78	1.07	3.79	1.00	3.79	1.02
<$20K	0.16		0.15		0.14		0.07	
$20-45K	0.33		0.32		0.33		0.29	
$45-70K	0.13		0.10		0.10		0.11	
>$70K	0.38		0.42		0.43		0.53	
Private health insurance	0.79		0.82		0.77		0.86	
Doctors visit	0.65		0.75		0.72		0.65	

NOTE: Standard deviation is only reported for non-binary variables.

Table 2.1. Logistic Regression Output for Internalizing Diagnoses - Grade 3 - Traditional v. Illness Career Framework

	Traditional Framework			Illness Career Framework								
	Diagnosis			Parental Concern			Professional Evaluation			Professional Diagnosis		
	b	SE	OR	b	SE	OR	b	SE	OR	b	SE	OR
African American	-1.14 ***	0.24	0.32	-0.51 ***	0.10	0.60	-0.77 **	0.23	0.46	-0.45	0.36	0.64
Hispanic	-0.48 **	0.18	0.62	-0.21 *	0.09	0.81	-0.60 **	0.18	0.55	0.31	0.33	1.37
Some College	0.36 *	0.17	1.43	0.12	0.09	1.13	0.27	0.18	1.31	0.25	0.28	1.28
Bachelor's degree or more	0.35 *	0.17	1.41	0.23 **	0.09	1.26	0.16	0.18	1.17	0.12	0.28	1.13
Intercept	1.03 *	0.43	2.80	1.32 ***	0.24	3.75	1.49 **	0.47	4.43	1.64 *	0.67	5.14
-2LL	-1406.15			-4192.19			-919.16			-363.31		
Psuedo-R sq	0.0646			0.0342			0.0377			0.0174		
n	11,370			11,370			1,410			530		

*** p < .001 ** p < .01 * p < .05 ~ p < .10

NOTE: All models control for children's internalizing well-being, externalizing well-being, and attentiveness. Sample size for each model rounded to the nearest 10s.

Table 2.2. Logistic Regression Output for Externalizing Diagnoses - Grade 3 - Traditional v. Illness Career Framework

	Traditional Framework			Illness Career Framework								
	Diagnosis			Parental Concern			Professional Evaluation			Professional Diagnosis		
	b	SE	OR	b	SE	OR	b	SE	OR	b	SE	OR
African American	-0.83 ***	0.14	0.43	-0.32 ***	0.09	0.73	-0.41 **	0.14	0.66	-0.97 ***	0.24	0.38
Hispanic	-0.67 ***	0.13	0.51	-0.36 ***	0.08	0.70	-0.38 **	0.14	0.68	-0.53 *	0.24	0.59
Some College	0.13	0.11	1.14	0.12	0.07	1.12	0.07	0.13	1.08	0.07	0.22	1.07
Bachelor's degree or more	0.28 *	0.12	1.33	0.10	0.08	1.10	0.26 ~	0.14	1.30	0.32	0.24	1.38
Intercept	3.09 ***	0.32	21.90	3.56 ***	0.21	35.02	2.57 ***	0.40	13.05	2.52 ***	0.65	12.39
-2LL	-2517.70			-5200.44			-1520.35			-534.95		
Psuedo-R sq	0.12			0.11			0.04			0.03		
n	11,600			11,600			2,230			990		

*** p < .001 ** p < .01 * p < .05 ~ p < .10

NOTE: All models control for children's internalizing well-being, externalizing well-being, and attentiveness. Sample size for each model rounded to the nearest 10s.

Table 3.1. Logistic Regression Output for Internalizing Diagnoses - Grade 3 - Parental Concern

	Model 1			Model 2			Model 3			Model 4			Model 5		
	b	SE	OR	b	SE	OR	b	SE	OR	b	SE	OR	b	SE	OR
African American	-0.51 ***	0.10	0.60	-0.70 ***	0.11	0.50	-0.67 ***	0.11	0.51	-0.76 ***	0.11	0.47	-0.74 ***	0.11	0.48
Hispanic	-0.21 *	0.09	0.81	-0.25 **	0.10	0.78	-0.24 *	0.10	0.79	-0.31 **	0.10	0.73	-0.30 **	0.10	0.74
Some College	0.12	0.09	1.13	0.15 ~	0.09	1.17	0.15 ~	0.09	1.16	0.20 *	0.09	1.23	0.19 *	0.09	1.21
Bachelor's degree or more	0.23 **	0.09	1.26	0.30 **	0.09	1.35	0.32 **	0.10	1.38	0.41 ***	0.10	1.51	0.42 ***	0.10	1.52
Cultural Resources															
Parent-Child Activities							-0.31 ***	0.07	0.73				-0.33 ***	0.07	0.72
Child Activities							-0.04	0.03	0.96				-0.04	0.03	0.97
Parental School Involvement							0.11 ***	0.02	1.12				0.12 ***	0.02	1.13
Parent-to-Parent							-0.03 **	0.01	0.97				-0.03 **	0.01	0.97
Educational Expectations							-0.15 ~	0.08	0.86				-0.13	0.08	0.88
Family Routine							0.00	0.03	1.00				0.00	0.03	1.00
Finanical Resources															
$20-45K										-0.22 *	0.11	0.81	-0.23 *	0.11	0.79
$45-70K										-0.19	0.15	0.83	-0.23	0.15	0.80
$70+K										-0.39 **	0.13	0.68	-0.43 **	0.13	0.65
Private Health Insurance										0.04	0.09	1.04	0.03	0.09	1.03
Doctor Visits										-0.09	0.07	0.92	-0.07	0.07	0.93
Intercept	1.32 ***	0.24	3.75	1.36	0.86	3.89	1.98 *	0.89	7.26	1.54 ~	0.86	4.68	2.15 *	0.89	8.59
Additional Controls	NO			YES			YES			YES			YES		
-2LL	-4192.19			-4142.27			-4110.98			-4136.56			-4104.51		
Psuedo-R sq	0.0342			0.0457			0.0529			0.047			0.0544		

*** p < .001 ** p < .01 * p < .05 ~ p < .10

NOTE : All models control for children's internalizing well-being, externalizing well-being, and attentiveness

Table 3.2. Logistic Regression Output for Externalizing Diagnoses - Grade 3 - Parental Concern

	Model 1			Model 2			Model 3			Model 4			Model 5		
	b	SE	OR	b	SE	OR	b	SE	OR	b	SE	OR	b	SE	OR
African American	-0.32 ***	0.09	0.73	-0.30 **	0.09	0.74	-0.26 **	0.09	0.77	-0.32 **	0.09	0.72	-0.28 **	0.09	0.76
Hispanic	-0.36 ***	0.08	0.70	-0.29 **	0.09	0.75	-0.25 **	0.09	0.78	-0.30 **	0.09	0.74	-0.26 **	0.09	0.77
Some College	0.12	0.07	1.12	0.12	0.07	1.13	0.17 *	0.08	1.19	0.15 ~	0.08	1.16	0.20 *	0.08	1.22
Bachelor's degree or more	0.10	0.08	1.10	0.09	0.08	1.09	0.23 **	0.09	1.26	0.10	0.09	1.10	0.23 *	0.09	1.26
Cultural Resources															
Parent-Child Activities							-0.24 ***	0.06	0.79				-0.24 ***	0.06	0.78
Child Activities							-0.05 ~	0.03	0.95				-0.06 *	0.03	0.95
Parental School Involvement							0.08 ***	0.02	1.09				0.08 ***	0.02	1.09
Parent-to-Parent							-0.04 **	0.01	0.96				-0.04 **	0.01	0.96
Educational Expectations							-0.45 ***	0.07	0.64				-0.46 ***	0.07	0.63
Family Routine							0.02	0.03	1.02				0.02	0.03	1.02
Finanical Resources															
$20-45K										-0.30 **	0.10	0.74	-0.30 **	0.10	0.74
$45-70K										-0.30 *	0.13	0.74	-0.30 *	0.13	0.74
$70+K										-0.20 ~	0.12	0.82	-0.17	0.12	0.85
Private Health Insurance										-0.02	0.08	0.98	-0.01	0.08	0.99
Doctor Visits										0.04	0.06	1.04	0.08	0.06	1.08
Intercept	3.56 ***	0.21	35.02	4.77 ***	0.76	117.59	5.36 ***	0.79	211.99	4.97 ***	0.76	144.49	5.57 ***	0.80	263.46
Additional Controls	NO			YES			YES			YES			YES		
-2LL	-5200.44			-5178.15			-5118.80			-5171.88			-5111.57		
Psuedo-R sq	0.1069			0.1107			0.1209			0.1118			0.1222		

*** p < .001 ** p < .01 * p < .05 ~ p < .10

NOTE: All models control for children's internalizing well-being, externalizing well-being, and attentiveness

Table 4.1. Logistic Regression Output for Internalizing Diagnoses - Grade 3 - Professional Evaluation

	Model 1			Model 2			Model 3			Model 4			Model 5		
	b	SE	OR	b	SE	OR	b	SE	OR	b	SE	OR	b	SE	OR
African American	-0.77 **	0.23	0.46	-0.80 **	0.24	0.45	-0.77 **	0.24	0.46	-0.68 **	0.25	0.51	-0.68 **	0.25	0.51
Hispanic	-0.60 **	0.18	0.55	-0.59 **	0.20	0.56	-0.49 *	0.20	0.61	-0.52 *	0.20	0.60	-0.44 *	0.20	0.64
Some College	0.27	0.18	1.31	0.32 ~	0.18	1.38	0.20	0.18	1.22	0.25	0.19	1.29	0.17	0.19	1.18
Bachelor's degree or more	0.16	0.18	1.17	0.25	0.19	1.28	0.07	0.20	1.07	0.05	0.21	1.05	-0.05	0.22	0.95
Cultural Resources															
Parent-Child Activities							0.25 ~	0.14	1.28				0.25 ~	0.15	1.28
Child Activities							0.11 ~	0.06	1.12				0.10	0.06	1.10
Parental School Involvement							0.14 **	0.05	1.15				0.12 *	0.05	1.13
Parent-to-Parent							-0.03	0.02	0.97				-0.03	0.02	0.97
Educational Expectations							-0.26	0.16	0.77				-0.34 *	0.17	0.71
Family Routine							0.06	0.07	1.06				0.05	0.07	1.06
Finanical Resources															
$20-45K										-0.09	0.22	0.91	-0.11	0.23	0.90
$45-70K										0.06	0.32	1.06	0.00	0.32	1.00
$70+K										0.34	0.26	1.40	0.30	0.28	1.35
Private Health Insurance										0.13	0.19	1.14	0.10	0.19	1.11
Doctor Visits										0.58 ***	0.14	1.79	0.55 ***	0.14	1.74
Intercept	1.49 **	0.47	4.43	-0.24	1.60	0.78	-1.70	1.66	0.18	-0.34	1.63	0.71	-1.53	1.69	0.22
Additional Controls	NO			YES			YES			YES			YES		
-2LL	-919.16			-895.81			-884.43			-880.93			-871.85		
Psuedo-R sq	0.0377			0.0622			0.0741			0.078			0.0873		

*** p < .001 ** p < .01 * p < .05 ~ p < .10

NOTE : All models control for children's internalizing well-being, externalizing well-being, and attentiveness

Table 4.2. Logistic Regression Output for Externalizing Diagnoses - Grade 3 - Professional Evaluation

	Model 1			Model 2			Model 3			Model 4			Model 5		
	b	SE	OR	b	SE	OR	b	SE	OR	b	SE	OR	b	SE	OR
African American	-0.41 **	0.14	0.66	-0.41 **	0.16	0.67	-0.41 *	0.16	0.67	-0.39 *	0.16	0.68	-0.39 *	0.16	0.67
Hispanic	-0.38 **	0.14	0.68	-0.28 ~	0.15	0.75	-0.20	0.15	0.82	-0.25	0.15	0.78	-0.18	0.16	0.84
Some College	0.07	0.13	1.08	0.09	0.13	1.10	0.07	0.13	1.07	0.06	0.13	1.07	0.06	0.13	1.06
Bachelor's degree or more	0.26 ~	0.14	1.30	0.26 ~	0.14	1.30	0.24	0.15	1.28	0.22	0.15	1.24	0.24	0.16	1.27
Cultural Resources															
Parent-Child Activities							0.31 **	0.11	1.37				0.28 *	0.11	1.33
Child Activities							0.06	0.05	1.06				0.05	0.05	1.05
Parental School Involvement							0.05	0.04	1.05				0.04	0.04	1.04
Parent-to-Parent							-0.01	0.01	0.99				-0.01	0.01	0.99
Educational Expectations							-0.31 **	0.12	0.74				-0.34 **	0.12	0.71
Family Routine							0.08	0.05	1.08				0.07	0.05	1.07
Finanical Resources															
$20-45K										0.01	0.16	1.01	-0.02	0.17	0.98
$45-70K										0.10	0.23	1.11	0.08	0.23	1.09
$70+K										0.07	0.19	1.07	0.05	0.20	1.05
Private Health Insurance										-0.08	0.14	0.92	-0.07	0.14	0.93
Doctor Visits										0.50 ***	0.11	1.64	0.45 ***	0.11	1.57
Intercept	2.57 ***	0.40	13.05	1.64	1.25	5.17	0.17	1.31	1.19	1.50	1.26	4.48	0.27	1.32	1.31
Additional Controls	NO			YES			YES			YES			YES		
-2LL	-1520.35			-1508.78			-1493.85			-1494.42			-1481.24		
Psuedo-R sq	0.0356			0.0429			0.0524			0.0521			0.0604		

*** p < .001 ** p < .01 * p < .05 ~ p < .10

NOTE: All models control for children's internalizing well-being, externalizing well-being, and attentiveness

APPENDIX A.

Table A1.1. Y-Standardized Coefficients for Logistic Regression Estimates of Parental Concern in Grade 3

	Internalizing Diagnoses					Externalizing Diagnoses				
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 1	Model 2	Model 3	Model 4	Model 5
African American	-0.26	-0.35	-0.34	-0.38	-0.38	-0.14	-0.12	-0.10	-0.13	-0.11
Hispanic	-0.13	-0.14	-0.13	-0.16	-0.16	-0.22	-0.18	-0.16	-0.18	-0.16
Some College	0.06	0.08	0.07	0.11	0.10	0.06	0.05	0.07	0.06	0.08
Bachelor's degree or more	0.13	0.17	0.17	0.22	0.22	0.05	0.04	0.10	0.04	0.10
Cultural Resources										
Parent-Child Activities			-0.14		-0.07			-0.10		-0.10
Child Activities			-0.01		-0.01			-0.02		-0.02
Parental School Involvement			0.06		0.06			0.04		0.04
Parent-to-Parent			-0.02		-0.02			-0.02		-0.02
Educational Expectations			-0.07		-0.05			-0.21		-0.21
Family Routine			0.00		0.00			0.01		0.01
Finanical Resources										
$20-45K				-0.09	-0.10				-0.13	-0.13
$45-70K				-0.11	-0.13				-0.12	-0.12
$70+K				-0.17	-0.19				-0.07	-0.06
Private Health Insurance				0.00	-0.01				-0.01	-0.01
Doctor Visits				-0.05	-0.04				0.00	0.01
Mental Health Symptoms	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Additional Controls	NO	YES	YES	YES	YES	NO	YES	YES	YES	YES

NOTE : All models control for children's internalizing well-being, externalizing well-being, and attentiveness

Table A1.2. Y-Standardized Coefficients for Logistic Regression Estimates of Professional Evaluation in Grade 3

	Internalizing Diagnoses					Externalizing Diagnoses				
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 1	Model 2	Model 3	Model 4	Model 5
African American	-0.44	-0.49	-0.46	-0.45	-0.44	-0.20	-0.23	-0.22	-0.22	-0.22
Hispanic	-0.36	-0.34	-0.28	-0.31	-0.27	-0.16	-0.12	-0.08	-0.12	-0.08
Some College	0.16	0.19	0.14	0.16	0.13	0.04	0.06	0.05	0.06	0.06
Bachelor's degree or more	0.08	0.14	0.05	0.07	0.02	0.13	0.13	0.13	0.13	0.14
Cultural Resources										
Parent-Child Activities			0.05		0.05			0.14		0.12
Child Activities			0.06		0.05			0.02		0.02
Parental School Involvement			0.07		0.06			0.03		0.03
Parent-to-Parent			-0.01		-0.01			-0.01		-0.01
Educational Expectations			-0.12		-0.15			-0.19		-0.20
Family Routine			0.03		0.02			0.03		0.02
Finanical Resources										
$20-45K				-0.06	-0.06				0.03	0.01
$45-70K				-0.01	-0.05				0.03	0.02
$70+K				0.09	0.06				0.02	0.01
Private Health Insurance				0.03	0.02				-0.08	-0.08
Doctor Visits				0.31	0.29				0.26	0.24
Mental Health Symptoms	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Additional Controls	NO	YES	YES	YES	YES	NO	YES	YES	YES	YES

NOTE : All models control for children's internalizing well-being, externalizing well-being, and attentiveness

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Chapter 3. Social Advantage and the Association between Mental Health Diagnoses and Children's Academic Achievement

Individual mental health is a cause and consequence of social inequality. The stress and strain of living in disadvantaged circumstances tends to detract from individuals' mental health well-being, while individuals who display more prominent symptoms of mental health problems are often hindered by those problems in their efforts to succeed and achieve throughout life (Goffman 1961; Horwitz 1982; Kessler and Walters 1998; McLeod and Owens 2004; Miech et al. 1999; Robins and Reiger 1991; Rushing 1971; Scheff 1966). Part of the process whereby mental health infringes upon individuals' efforts to succeed involves the link between symptoms and educational attainment (McLeod and Fettes 2007; McLeod and Kaiser 2004; Wang et al. 1999). Poorer mental health is associated with lower academic success, and while the decline in educational accomplishments has consequences for individuals' life-course status attainment (Jayakody, Danziger and Kessler 1998), the literature on mental health and achievement has almost entirely focused on symptoms. Largely missing from this research are studies of the consequences of mental health diagnoses. That is, sociologists of mental health and social stratification scholars tend to study the correlates of or consequences from symptoms, but rarely the consequences of diagnosis.

Are children's mental health diagnoses, such as ADD/ADHD, depression, and anxiety, associated with academic achievement? Findings from education researchers seem to suggest that the answer is "yes", and the relationship appears to be negative (Frazier et al. 2007; Loe and Feldman 2007; Nelson et al. 2004; Wagner, Cameto and Newman 2003; Wagner et al. 2002). Among the many social and academic difficulties

faced by children with mental health disorders, diagnosed children tend to receive lower grades (DuPaul et al. 2004), lag behind their peers in the acquisition of academic skills (Barry, Lyman and Klinger 2002; Wagner, Cameto and Newman 2003), and are more likely to be retained a grade (Bussing et al. 2010). Further still, diagnosed children are more likely to drop out of high school and less likely to transition into postsecondary schooling (Breslau et al. 2008; Wagner, Cameto and Newman 2003). Consequently, the more than 5 million children and youth currently diagnosed with a mental health problem seem to be at an increased risk of struggling through the education system and failing to attain the knowledge, skills, and certification essential for later-life success. However, despite this research suggesting that diagnoses are negatively related to achievement, prior research has not clearly differentiated the "effects" of diagnosis from other related factors, such as mental health symptoms and children's sociodemographic characteristics.

The link between diagnosis and achievement is difficult to discern, because children's mental health diagnoses represent a constellation of social and psychological factors. Factors that influence whether a child is diagnosed are also related to children's academic achievement. For instance, diagnosis status (e.g., whether or not a child is diagnosed) is indicative of elevated mental health symptoms, and psychological well-being is important for children's schooling outcomes (McLeod and Fettes 2007; Needham 2009). Additionally, children's diagnoses reflect social factors, including but not limited to, children's race/ethnicity and social class, both of which have historically been linked to academic achievement gaps (Brooks-Gunn, Klebanov and Duncan 1996; Cheadle 2008; Duncan, Brooks-Gunn and Klebanov 1994; Entwisle, Alexander and Olson 1997; Yeung and Pfeiffer 2009). Nevertheless, these potentially confounding

factors have not received full consideration in previous studies attempting to identify the association between diagnosis and achievement.

Furthermore, beyond the question of association between diagnosis and achievement is inquiry into the variability of the relationship across social groups. Special education and health policy researchers typically examine the overall relationship between mental health diagnoses and children's educational outcomes (Eisenberg and Schneider 2007; Wagner et al. 2003), which implicitly assumes that the association is the same for all children. Yet, children are diagnosed with mental health problems from families across the social class and race/ethnicity spectrum; therefore, children with diagnoses have access to differing types and levels of resources that might protect them against or exacerbate further the association between diagnosis and achievement. Thus, while mental health diagnoses may *generally* serve as a marker for lower educational outcomes, they may be more or less consequential depending on the social background of children.

This project thus examines the consequences of mental health diagnoses for children's academic achievement net of a range of confounding factors, and investigates whether the association varies across social groups. More specifically, I use data from the Early Childhood Longitudinal Study – Kindergarten cohort (ECLS-k) to identify all children diagnosed with ADD/ADHD or emotional disturbances (e.g., depression, anxiety, phobia, etc.), and use HLM growth modeling to estimate the relationship between diagnosis and children's math and reading test scores from kindergarten through eighth-grade. I find that ADD/ADHD diagnosis is associated with a decline in achievement, while ED diagnosis is associated with a slight increase, controlling for

symptoms, social class (e.g., parental educational attainment), and race/ethnicity. Importantly, the association between diagnosis and achievement was significantly moderated by children's background. ADD/ADHD and ED diagnoses were most negatively associated with academic achievement for children whose parents had the lowest educational attainment. The association was less negative and in some cases positive for children with more educated parents. A similar, albeit less distinct pattern was observed for white versus African American and Hispanic children. The relationship between diagnosis and academic achievement thus appears to depend on children's backgrounds, as social advantage insulates children against the negative repercussions of diagnosis. These findings contribute to current explanations of how children's mental health is involved in and related to the production and reproduction of academic (and potentially social) inequality.

Literature Review

According to recent estimates, nearly 30 percent of children experience a mental health problem in childhood or adolescence that affects some aspect their daily life, and nearly 5 percent have a mental illness debilitating enough to severely limit functioning (Kessler et al. 2005; Miech et al. 1999). Of the many diagnoses children can receive for mental health problems, the most prevalent is attention-deficit/hyperactivity disorder (ADHD), which is estimated to impact 3-7 percent of all school-aged children, or approximately 4.5 million individuals between the ages of 6 and 17 years old in the United States (Bloom and Cohen 2007). Other diagnoses, not as prevalent but still widespread among children include depression, anxiety, and social phobias, which can be categorized under the general heading of emotional disturbances (ED). Currently, there

are more than 457,000 individuals in the United States' between the ages of 6 and 21 years old with ED (U. S. Department of Education 2006a; U. S. Department of Education 2006b). Moreover, in the last twenty years, the proportion of children diagnosed with a mental health problem has nearly doubled (U. S. Department of Education 2006b). Thus, any association between diagnosis and academic achievement has implications for the educational outcomes of a large and growing number of children and their families; yet, sociology tends to overlook diagnoses and instead concentrates its mental health research on the consequences of symptoms (e.g., McLeod and Fettes 2007).

In comparison, education and health policy researchers have studied children's mental health diagnoses more thoroughly, and typically found diagnoses to be negatively related to children's academic achievement. For example, Eisenberg and Schneider (2007) found differences in the mean math and reading scores of ADHD and non-ADHD children. Others have identified the same score gap between ADHD and non-ADHD children, but also shown how that these disparities expand with time (Scheffler et al. 2009). Similar evidence of academic struggle has also been reported for ED children. By the time ED children enter middle school their math and reading skills lag a full academic-year behind their peers (Blackorby et al. 2005), and this gap grows to 2 and 3 years in reading and math, respectively, when ED youth are in high school (Wagner et al. 2003). ADHD and ED youth are also more likely to drop out of high school and less likely to enroll in postsecondary education (Bussing et al. 2010; Laird et al. 2007). Children's mental health diagnoses thus appear to be negatively associated with academic achievement, and set into motion a series of educational failures that compound over time and eventually culminate in dropout and failure to obtain advanced degrees. This lower

educational attainment then subsequently relates to lower annual earnings, more frequent unemployment, and less overall life satisfaction (Jayakody, Danziger and Kessler 1998; Wang et al. 1999; Wildman 2003).

The Complexity of Children's Mental Health Diagnoses

Though the evidence suggests a relatively clear negative effect of diagnosis on achievement, there is still reason for uncertainty in this association. Diagnoses represent a combination of social and psychological markers, and these factors have themselves been historically linked to children's educational outcomes. For example, mental health symptoms, social class, and race and ethnicity, each of which importantly contributes to deciding who becomes diagnosed, are also related to children's outcomes. Still, these confounding factors have not always been included in prior research examining the relationship between diagnosis and achievement. Some research has left out these factors because of limits imposed by the small and clinical samples used in their analyses (e.g., Nelson et al. 2004). For example, Barkely and associates (1990) followed a group of 158 hyperactive children for 8 years, and compared their social and educational results to 66 non-hyperactive children. Hyperactive children were suspended from school or retained a grade at nearly 3 times the rate of their "normal" peers. This finding however was based upon a simple comparison of proportions, and does not take into consideration differences in children's social backgrounds or mental health symptoms. Barkely had intended to match children based on social background during the data collection phase, but differences in the two groups still emerged and with so few cases it was difficult to statistically control for these dissimilarities (see also, Barry, Lyman and Klinger 2002; DuPaul et al. 2004).

The issue described above could potentially be resolved with larger samples; however, recent studies employing nationally representative data have also been limited in their ability to identify the association between diagnosis and achievement, net of confounding factors. For instance, Blackorby and associates (2005) used data from the Special Education Elementary Longitudinal Study (SEELS) to show that ED children were on average one year below grade-level in their math and reading skills, but this comparison was calculated using students' performance on grade-level equivalency tests and comparing it to their current grade level in school (see Blackorby et al., 2005, pg. 4-10). In other words, ED children were not compared to non-ED children, but compared to their current status in schools (see also, Wagner et al. 2003). Other research has employed large-scale surveys with the ability to more thoroughly consider confounding factors, but nevertheless relied upon basic mean comparisons to examine differences in academic achievement. In particular, the gaps in math and reading achievement between ADHD and non-ADHD children reported by Eisenberg and Schneider (2007) used data from the Early Childhood Longitudinal Study – Kindergarten cohort; however, their analysis was based on an independent samples t-test. Thus no confounding factors were considered, and it is not clear whether the gap in achievement associated with diagnosis was a product of the diagnosis or reflective of the symptoms and sociodemographic characteristics of diagnosed children.

Diagnosed children almost by definition have poorer mental health, and psychological and emotional well-being is important for children's schooling success. For instance, Crosnoe (2006) showed that children's internalizing and externalizing problems predicted math scores and gains in first grade, as children with poorer mental

health had lower scores and gained less than their peers with better mental health. Distressed, distracted, or depressed children also tend to receive lower grades in elementary and middle school (DiLalla, Marcus and Wright-Phillips 2004; Farmer and Bierman 2002). Moreover, children's psychological problems increase the likelihood of course failure, grade retention, high school drop-out, and abstaining from postsecondary schooling (Coutinho and Denny 1996; Ensminger and Slusarick 1992; Entwisle, Alexander and Olson 2005; McLeod and Fettes 2007; McLeod and Kaiser 2004; Needham, Crosnoe and Muller 2004). Thus, the gap found by prior research associated with diagnosis may actually reflect the decline in achievement brought on by the accompanying symptoms.

Other confounding factors are children's social class and race/ethnicity, although the consequences of omitting these factors from prior analyses are complicated by recent evidence contradicting the typical inverse association between social advantage and mental health diagnoses. Typically, children from less advantaged families—working class/poor families and historically disadvantaged racial/ethnic minority families—are more likely to experience mental health issues (Costello et al. 2003; McLeod and Nonnemaker 2000; Miech et al. 1999; Strohschein 2005). However, this inverse association has most frequently been observed for symptoms of mental health problems, and a more complex relationship exists when considering mental health diagnoses. Some evidence suggests that advantaged children are less likely to be diagnosed. For instance, Wagner, Cameto, and Newman (2003) showed that children from families earning over $50,000/year were under-represented among students receiving special education for a mental health or emotional problem. Additionally, Wagner et al. (2002) found that

African American children were over-represented among individuals diagnosed with an emotional disturbance. Nevertheless, other research indicates that advantaged family background may increase children's likelihood of being diagnosed. For example, Schneider and Eisenberg (2006) reported that white children were more likely to be diagnosed with ADHD than their minority peers, and Pastor and Reuben (2005) found that children whose parents' annual income was more than 400 percent the poverty threshold had a slightly higher rate of ADHD diagnosis than children whose parents earned at or below the poverty line (see also, LeFever, Dawson and Morrow 1999).

The uncertain association between race/ethnicity, social class, and children's mental health diagnoses obscures the implication of these variables for understanding the negative association between diagnosis and achievement. Children from middle class families tend to score higher than their peers from working-class/poor families on academic assessments (Cheadle 2008; Downey, von Hippel and Broh 2004; Entwisle, Alexander and Olson 2007), are more likely to be placed in high-ability groups or enroll in advanced courses throughout their academic careers (Condron 2008; Riegle-Crumb and Grodsky 2010), and are more likely to graduate from high school and continue on to post-secondary schooling (Rumberger 1987). Therefore, if middle class children are over-represented among the diagnosed, failing to consider the role of social class could produce a smaller-than-actual estimated negative association between diagnosis and achievement. Conversely, if disadvantaged children are more likely to be diagnosed, then the uncorrected negative association between diagnosis and achievement may partially reflect the lower status of the diagnosed children. Not including social class

could thus potentially provide misleading estimates of the association between diagnosis and achievement.

Similar academic and mental health inequalities between race and ethnic groups also pose potentially confounding effects on the association between diagnosis and achievement. White children appear to be over-represented among individuals diagnosed with certain mental health disorders, such as ADD/ADHD, and yet white children also tend to outperform their minority peers with the exception of Asian students. White children enter school with more reading and math skills and their advantage grows over time (Alexander and Entwisle 1988; Condron 2009; Downey, von Hippel and Broh 2004; Fryer and Levitt 2004), and acial/ethnic minority children are also more likely to be retained a grade and drop out of high school (Hauser, Pager and Simmons 2000). Thus, if minorities are under-represented among diagnosed individuals and race/ethnicity is not included in the analysis then the estimation of the detriment of diagnosis may actually be too small. Alternatively, if historically disadvantaged children—African Americans and Hispanics—are over-represented among the diagnosed, then the negative association between diagnosis and achievement may be partially attenuated when race/ethnicity is included. Regardless, if race/ethnicity is not considered then the estimates are potentially biased, and the seemingly well-established association between diagnosis and achievement may be incorrect.

Moderating Effects of Social Class and Race/Ethnicity

Children from more or less advantaged social positions are not immune from nor are they guaranteed of receiving a diagnosis; therefore, children encounter mental health diagnoses coming from widely varying backgrounds with differing levels of social and

financial resources. These differing resources might alter the consequences associated with diagnosis. Yet, most prior research examining the association between diagnosis and academic achievement has only considered general trends, thereby situating the diagnosis within children's education as if it mattered equally for everyone. Thus, beyond simply understanding the association between diagnosis and children's achievement is examining variability in this association.

The social and financial resources in children's families have the potential to alter the relationship between diagnosis and achievement, but it is not clear a priori how the relationship might vary across family backgrounds. According to one line of research, potentially detrimental experiences only have (or have larger) negative consequences for disadvantaged individuals: a relationship sometimes referred to as "double disadvantage" (Crosnoe 2005). Advantaged individuals, in comparison, are not negatively impacted if they are exposed to the supposedly negative experience. In prior research, evidence of double disadvantage has been observed in studies focused of adolescent delinquency and educational attainment (Jessor, Donovan and Costa 1993). For example, Hagan (1991) showed that the negative consequences of adolescent delinquency for status attainment were only experienced by individuals from working-class/poor families. "Males with non-working-class origins who identif[ied] with the delinquent subculture [were] apparently shielded from its deleterious effects" (Hagan 1991, pg. 579). As an extension of this logic, double disadvantage would predict that less advantaged children—racial/ethnic minority and working-class/poor children—will experience the greatest detriment from diagnosis, whereas white and middle class children will be able to minimize the negative consequences.

It is possible that the resources available to white and middle class children help reduce the negative consequences of mental health diagnoses by providing easier access to services and accommodations (Jessor, Donovan and Costa 1993). Additionally, middle class parents may be more actively engaged in their children's schooling thus granting them the ability to monitor and engage schools more thoroughly and consistently making sure their children receive the best available education (e.g., Blum 2007). Socially advantaged children may therefore also be "shielded from [the] deleterious effects" of mental health diagnoses, while disadvantaged children experience the largest related declines in achievement.

Alternatively, mental health diagnoses could be more detrimental for white and middle class children, because these children have the most to lose from being diagnosed. Working-class/poor and racial/ethnic minority children may be relatively immune from the negative consequences typically associated with diagnosis, because of the socially and economically impoverished conditions in which they live (Hannon 2003). In prior research, this claim has been referred to as disadvantage saturation (Streeter and Franklin 1991). According to disadvantage saturation, working-class/poor and racial/ethnic minority children may aspire to socially prescribed ideals of status attainment (e.g., college education and well-paying job), but without adequate community and financial resources, even those children who "follow the rules" are often unable to lift themselves out of their impoverished origins (MacLeod 1987).

Evidence of disadvantage saturation has previously been observed in research on educational attainment. For example, Hannan (2003) showed that adolescent problem behavior was more strongly predictive of dropping out and completing fewer years of

schooling for middle class children than children from poor families (see also, Streeter and Franklin 1991). Based upon these results, Hannan (2003) concluded that problem behavior was "of little practical consequence" for disadvantaged children since their "achievement and attainment levels [were] largely predetermined by structural constraints" (pg. 591). Following this logic, mental health diagnoses may be of "little practical consequence" for disadvantaged children because they are already faced with structural limitations greatly impeding their chances for academic achievement. That is, the achievement levels of disadvantaged children are already truncated by the structural conditions in which they live, so the addition of a mental health diagnosis may be largely inconsequential.

Double disadvantage and disadvantage saturation provide opposing accounts of how the association between diagnosis and achievement may vary according to children's social background. Evidence of either pattern would make an important contribution to understanding the intersection of mental health and social inequality

DATA AND METHODS

Data

This study uses data from the restricted-license data file of the Early Childhood Longitudinal Study – Kindergarten cohort (ECLS-k). Funded by the National Center for Education Statistics, the ECLS-k is a seven-wave panel study that collected data on over 20,000 children during their Kindergarten year in the Fall of 1998, and followed them until Spring 2007 (Tourangeau et al. 2006). The sample was originally designed as a three-stage stratified random sample, with students nested in schools, which were nested

in counties. Data was collected from child, parent, teacher, and school administrator, to provide several perspectives regarding children's family and educational circumstances.

In addition to the use of multiple informants, the ECLS-k collected data on several dimensions of children's lives, such as physical development (e.g., height and weight), family environment (e.g., annual income, parenting practices, material resources), academic achievement (e.g., math, reading, and general knowledge/science assessments), and children's health. As part of the health data, information was gathered about children's disabilities, both physical (e.g., visual, hearing, and speech) and mental (e.g., learning, activity, and emotional).

Measures

The dependent variable for this analysis is academic achievement, which is based on children's reading and math test scores.[1] The ECLS-k measured children's academic skills using a two-stage testing procedure. In the first stage, all children received a set of questions of comparable difficulty, called routing questions. Based upon children's performance in the first stage, they were allotted a second series of questions of varying difficulty. ECLS-k programmers then used item response theory (IRT) to combine the two-stage assessment procedure, and provide each child with a reading and math score. IRT uses the pattern of right, wrong, and omitted responses in combination with information on the difficulty and "guess-ability" of each test question to score students on a continuous scale. These scores can be compared between students, as well as across

[1] I use math and reading scores instead of some other indicator of academic achievement, such as grades or teacher evaluation, because the ECLS-k does not provide measures of children's grades nor consistent measures of teachers' direct evaluations of student ability (Tourangeau et al., 2006).

time for the same student regardless of the difficulty of the second-stage questions (Tourangeau et al. 2006).

To predict children's academic achievement, the independent variable of interest is mental health diagnosis. *Mental health diagnosis* is created based upon parent reports indicating if children were diagnosed with ADD or ADHD (ADD/ADHD) or an emotional disturbance (ED; e.g., depression, anxiety, SED, etc.). If a parent reported that their child had been diagnosed, they were also asked to report the year in which the child was diagnosed. Based on this information, I constructed a time-varying measure of mental health diagnosis that matched children's diagnosis status to each data collection wave.[2] Values for ADD/ADHD and ED were coded as 0 for waves in which children were non-diagnosed, and 1 for the first wave (and every subsequent wave) in which the diagnosis was registered. Thus, once children were diagnosed, their status remained as such for the duration of the study. Finally, only diagnoses obtained after children started school (e.g., calendar year 1998 or later) were included in the analysis.

The primary covariates of interest are children's mental health symptoms, social class, and race/ethnicity. Children's mental health symptoms were measured as time-varying indicators of *internalizing well-being, externalizing well-being*, and *attentiveness*. Internalizing and externalizing well-being are based upon scales provided by the ECLS-k taken from parent, teacher, and child reports of children's socio-emotional behaviors. The scales were originally coded to measure children's internalizing problems (e.g., child

[2] Kindergarten wave included calendar years 1998 and 1999, Grade 1 wave included calendar year 2000, Grade 3 wave included calendar years 2001 and 2002, Grade 5 wave included calendar years 2003 and 2004, and Grade 8 wave included all calendar years greater than 2004.

is sad, lonely) and externalizing problems (e.g., child is impulsive, quick tempered),[3] so to compute the measure used in the analysis, I reverse coded the variables such that a higher score indicated better mental health. Next, I averaged together the scale scores from the informants. Importantly, the identity of the informant changed over time. Specifically, in kindergarten and grade 1 the measures of internalizing and externalizing well-being are the average scores taken from parent and teacher responses, in grade 3 and 5 the measures are derived from teacher and child responses, and in grade 8 the measures are based on parent and child responses. Although this could pose a problem for comparability, an examination of the bivariate correlations across waves revealed moderately strong and positive associations (results not shown), which suggests that the measures are reasonably comparable. Additionally, prior research has used a similar strategy to construct measures of children's psychosocial well-being from multiple informants, therefore there is some precedent (Potter 2010a). The third measure of mental health symptoms is attentiveness and is based on teacher reports of children's approaches to learning (e.g., motivation, classroom cooperation, etc.). Attentiveness (or lack thereof) is a key indicator of ADD/ADHD, and has also been linked to children's educational outcomes (Duncan et al. 2007), therefore this aspect of mental health may be particularly salient given the role of ADD/ADHD in this analysis.

As a proxy measure of social class, I relied upon a frequently used indicator of social advantage and family background: *parental educational attainment*. Parents reported their highest level of schooling completed from which four categories were

[3] The ECLS-k user's manual describes the index construction process, and reports that each index had relatively high internal validity ($\alpha > 0.70$) (for discussion of index construction, see Tourangeau et al., 2006, Chapter 3, pp. 38-42).

created representing qualitative breaks in attainment: high school diploma or less (reference group), some college experience, bachelor's degree, and post-graduate work. Categorical measures of parent's educational attainment were used instead of a continuous measure in order to account for possible non-linear associations.

Race/ethnicity was measured using the composite variable from the ECLS-k. The original variable had eight categories, which was reduced to five for the analysis: white (reference group), African American, Hispanic, Asian, and Other. Alternative categorizations were considered (e.g., more narrowly defining the Hispanic group) without altering the findings. Additionally, due to the limited number of Asian and Other children supplemental models were conducted that included only white, African American, and Hispanic children, which also revealed substantively similar patterns to those reported here.

The final variables of interest examine whether the association between diagnosis and achievement differs for children based on their social backgrounds. In order to accomplish this, I included multiplicative interaction terms between social class (e.g., parental educational attainment) and diagnosis status, and multiplicative interaction terms between race/ethnicity and diagnosis status. Interaction terms were created for each level of parent's educational attainment, however I was only able to include interaction terms for African American and Hispanic children, because there were too few Asians and Others diagnosed with a mental health problem. Although this slightly alters the interpretation of the race/ethnicity interaction terms (e.g., the comparison is no longer exclusively white children), the comparison group is *predominantly* white and

supplemental models including only white, African American, and Hispanic children showed similar patterns.

In addition to these primary covariates of interest, I also included three sets of control variables in an effort to correctly specify children's academic achievement. For a description of how these controls were constructed as well as a table differentiating between time-varying and time-invariant measures, please see Appendix A. The first set of control variables includes measures of children's characteristics, such as their gender (1 = Female) and age in kindergarten (in months), as well as time varying measures of grade retention (1 = Yes) and overall health (higher score indicating better health). The second set of variables controls for family structure and resources. Specifically, I include time varying measures for number of siblings and two-biological parents in the household (1 = Yes), as well as time invariant measures of region of the country (e.g., Northeast, Midwest, South, and West) and family's urbanicity (e.g., rural, suburban, urban).[4] To control for family resources, I included time-varying measures of neighborhood quality, annual income ($1000s), number of books in household, and whether children had changed homes (1 = Yes). The final set of control variables includes measures of family processes, such as parenting practices and discipline strategies. I include time-varying measures for parental school involvement, parent-to-parent communication, child activities, participation in high culture activities, family routines, parental warmth, parental depressiveness, parent-child activities, and parental educational expectations. Finally, there are two measures of discipline strategy: whether parents spank their

[4] The time invariant measures are based on children's values for their Kindergarten year, and although children moved during subsequent waves, there was very little variation with regards to changes in region or urbanicity.

children (1 = Yes) and whether parents talk with their children when their children do something wrong (1 = Yes).

Time

The ECLS-k has an unbalanced sample design, whereby children were tested at different dates during the spring semester of each wave. In order to model this design feature, child-specific time measures were computed by setting the grand mean test date of the Spring Kindergarten assessment to 0, and subtracting all assessment dates from this time point. The time variable thus captures variability in the initial assessment date (e.g., children assessed prior to the mean assessment date in Kindergarten receive a negative value, and children assessed after receive a positive value), as well as child-specific differences in the number of days between assessment occasions (e.g., the number of days between child *i*'s assessment occasion in a later wave and the mean assessment date for Spring Kindergarten is unique to child *i*). Time was initially computed in days, but to increase the relative size of the estimated coefficient, it was converted to years.

Missing Values

In order to maximize the sample size for the analysis, missing values were dealt with using multiple imputation via the ICE command in STATA (Royston 2007). Five data sets were imputed using all the variables contained in the model to estimate missing values. Because of the longitudinal nature of the data, imputation was performed with data in the person-file format, and then transposed to a person-period layout. To insure that certain variables took only positive values during the imputation process (for example, age), non-negative interval measures were transformed by taking their natural log prior to imputing, and then exponentiated to original scale for analysis.

METHODS

I examine the relationship between mental health diagnoses and academic achievement using a two-level HLM growth curve model (Fitzmaurice, Laird and Ware 2004; Raudenbush and Bryk 2002; Singer and Willett 2003). HLM growth models offer flexibility in the specification of the time measure, which is necessary given the data collection patterns of the ECLS-k, as well as allows for the inclusion of time-invariant and time-varying covariates. Additionally, I employed a two-level model (e.g., time nested within child) and used a Taylor linearization weighting strategy to adjust the standard errors for children's clustering within kindergarten schools, as well as the over-representation of Hispanic and Asian minorities in the sample. Descriptive statistics were generated in STATA; however, all other analyses were run using HLM software.

Preliminary analyses revealed a non-linear trend in children's math and reading scores from Kindergarten to eighth grade; therefore, all models contain TIME and $TIME^2$ to estimate the convex functional form of children's growth in math and reading. A total of six models are used in this analysis to estimate children's math and reading scores over time, with each subsequent model containing additional covariates and interaction terms. The full model is described below:

Level 1:

$$Y_{ti} = \pi_{0i} + \pi_{1i}\,(TIME_{ti}) + \pi_{2i}\,(TIME_{ti})^2 + \pi_{3i}\,(ADHD_{ti}) + \pi_{4i}\,(ED_{ti}) + \pi_{5i}\,(MHS_{ti}) + \pi_{6i}\,(CHILD_{ti}) + \pi_{7i}\,(FamSTRUCT_{ti}) + \pi_{8i}\,(FamPROCESS_{ti}) + e_{ti}$$

Level 2:

$$\pi_{0i} = \beta_{00} + \beta_{01}\,ParED_i + \beta_{02}\,RACE_i + \beta_{03}\,CHILD_i + \beta_{04}\,FamSTRUCT_i + r_{0i}$$

$$\pi_{1i} = \beta_{10} + r_{1i}$$

$$\pi_{3i} = \beta_{30} + \beta_{31}\ \text{ParED}_i + \beta_{32}\ \text{RACE}_i$$

$$\pi_{4i} = \beta_{40} + \beta_{41}\ \text{ParED}_i + \beta_{42}\ \text{RACE}_i$$

where Y is either children's math or reading score, ADHD and ED are the time-varying measures for mental health diagnosis status, and MHS is a vector of mental health symptoms (i.e., internalizing well-being, externalizing well-being, and attentiveness). Additional level-1 variables include the time-varying covariates for child characteristics (CHILD, e.g., health, grade retention), family structure and resources (FamSTRUCT, e.g., biological parents, siblings, household income, etc.), and family processes (FamPROCESS, e.g., parental depressiveness, parent-child activities, child activities, etc.).

There are four level-2 equations. The first, π_{0i}, estimates the intercept and includes the social class and race/ethnicity variables. ParED is the vector of dummy variables for parental educational attainment (e.g., social class) and RACE is the vector of race/ethnicity measures. CHILD and FamSTRUCT are vectors of the time invariant measures of children's characteristics (e.g., gender and age), and time invariant measures of family structure and resources (e.g., region and urbanicity). There are no time invariant measures of family processes, hence the lack of a covariate at level 2. The second level-2 equation, π_{1i}, estimates the coefficient for the linear effect of time. I do not include any covariates in this equation; however, I included a random effect so as to incorporate the individual variability in linear growth rates across children in my model. The third and fourth level-2 equations, π_{3i} and π_{4i}, test the interaction effects between social class, race/ethnicity, and children's mental health diagnoses (equation 3 corresponds to ADD/ADHD and equation 4 corresponds to ED). In the equations printed

above, parental educational attainment and race/ethnicity are included simultaneously, but they are examined separate from one another as well. Including social class (ParED) and race/ethnicity (RACE) in the third and fourth equations at level-2 evaluates whether the association between diagnosis and academic achievement differs across these social groups. Lastly, due to the large number of variables in the models, I only present a selection of results for the key variables of interest; complete results are available from the author upon request.

Comparison Group and Appropriate Sample Construction

While most prior research has compared the academic achievement of diagnosed children with *all* other non-diagnosed children, recent evidence suggests that it may not be appropriate to compare diagnosed with all other children. Potter (2010b) argued that the unequal distribution of diagnoses across groups of children in part resulted from the social process through which diagnoses were obtained. Using an illness career framework, he found that race/ethnicity, social class, and (in some cases) mental health symptoms could not differentiate between diagnosed and non-diagnosed children among children who were professionally evaluated. That is, race/ethnicity and social class, which differentiated diagnosed from *all* non-diagnosed children, failed to predict diagnosis status between children who had been professionally evaluated.

This pattern suggests that diagnosis status reflects more than children's mental health symptoms and sociodemographic characteristics, and to more accurately assess the association between diagnosis and achievement may require the use of a different comparison group. Two supplemental models are thus included in the analysis that restrict the sample to only children who were evaluated for a mental health problem

during at least one wave of the study. These models are designated as "Evaluation Children ONLY" models.

Results

Descriptive statistics for the time-invariant measures are reported separately for diagnosed and non-diagnosed children in Table 1. The time-varying mean and standard deviation for the outcome measures (children's math and reading scores) are reported separately by diagnosis status in Table 2.1. Lastly, Table 2.2 reports the kindergarten values for the remaining time-varying covariates, separately by diagnosis status. Based on these statistics, diagnoses are relatively evenly distributed across categories of parental educational attainment, but appear to be differently distributed across race and ethnicity. In particular, a greater proportion of diagnosed children are white, while African American and Hispanic children are under-represented. Additionally, boys are disproportionately represented among the diagnosed, especially among children with ADD/ADHD.

[Insert Table 1 about here]

The descriptive statistics also show a pattern of academic inequality that expands over time between diagnosed and all non-diagnosed children. The gap in children's math scores associated with ADD/ADHD increased from 0.4 standard deviations to nearly 0.6 standard deviations between kindergarten and grade 8. During this same time, the math gap for ED children increased slightly from 0.2 standard deviations to nearly 0.3 standard deviations. Similarly for reading, the gap for ADD/ADHD children increased from 0.5 standard deviations to nearly 0.7 standard deviations, and from 0.15 standard deviations to nearly 0.25 standard deviations for ED children. Thus, ADD/ADHD children appear

to do much worse academically than their non-diagnosed peers, and ED children seem to slightly under-perform. In general, the patterns of the descriptive statistics align with the conclusions of previous researchers and suggest that diagnoses are associated with a decline in children's math and reading achievement. Whether this relationship remains in a multivariate framework is examined next.

[Insert Table 2.1 about here]

[Insert Table 2.2 about here]

Mental Health Diagnoses and Academic Achievement

Table 3.1 reports selected coefficients from the models predicting the main effect of children's diagnoses on math scores. In the baseline model (Model 1), ADD/ADHD diagnosis was associated with a modest decline of 3.4 points, while the association between ED diagnosis and math achievement was non-significant ($p > .10$). Thus in line with prior research, children diagnosed with ADD/ADHD score lower than their non-diagnosed peers. In Model 2, the gap associated with ADD/ADHD was reduced slightly controlling for mental health symptoms, parental educational attainment, and race/ethnicity; however, it remained statistically significant indicating that the decline in achievement was not a reflection of these confounding factors. Model 3 included the other control variables, and the math score gap for ADD/ADHD children remained. Based on the results from Models 1 through 3, the evidence suggests that ADD/ADHD diagnosis is negatively associated with children's math achievement, and that this association is robust to numerous confounding and control factors. ED diagnosis, in comparison, was not associated with children's math achievement.

Model 3A provides an additional examination of the association between diagnosis and achievement, but the comparison group was changed to include only children who were evaluated for a mental health problem. With this newly defined comparison group a different pattern of associations was observed. In Model 3A, the gap between ADD/ADHD and non-ADD/ADHD children was no longer statistically significant, and further, children diagnosed with ED actually out-performed their non-diagnosed peers. This evidence provides an alternative account of the association between diagnosis and achievement, which suggests that under certain conditions diagnosis may be positively linked with math test scores; especially for ED diagnoses.

Table 3.2 reports the estimates for the association between mental health diagnoses and children's reading scores, and the patterns are similar to the ones reported in the math models with a few notable exceptions. First, in the baseline model both ADD/ADHD and ED were negatively associated with children's reading achievement. Once mental health symptoms, social class, and race/ethnicity were controlled however, the gap associated with ED was no longer significant (see Model 2). Additionally, unlike the math models, the gap for ADD/ADHD diagnosis was reduced when the control variables were included offering some evidence that family income and parenting may matter in terms of the association between diagnoses and children's reading scores (see Model 3). Finally, restricting the sample to only evaluated children again altered the association between diagnosis and achievement; however, ADD/ADHD continued to be negatively associated with reading scores, and although the coefficient for ED diagnosis was trending positive it did not reach marginal significance ($p > .10$; see Model 3A).

Taken together, Tables 3.1 and 3.2 provide evidence connecting children's mental health diagnoses with academic achievement. Although simple mean comparisons of diagnosed and non-diagnosed children's test scores indicated gaps in academic achievement associated with diagnosis, part of the observed gap was explained by children's mental health symptoms, social class, and race/ethnicity. Additionally, the supplemental models (Model 3A) provided evidence that the gaps partially reflected the comparison of diagnosed with *all* non-diagnosed children. Thus, the association between diagnoses and academic achievement net of mental health symptoms, social class (e.g., parental educational attainment), and race/ethnicity appears tenuous. Reported findings provide evidence that not all mental health problems are similarly related to children's academic achievement; thereby furthering the current understanding of the consequences associated with mental health diagnoses for children. Moreover, there is still the question of whether the association with achievement is similar across social groups. I turn to this analysis next.

[Insert Table 3.1 about here]

[Insert Table 3.2 about here]

The Association between Diagnosis and Achievement across Social Class and Race/ethnicity

To consider whether a pattern of double disadvantage or disadvantage saturation describes the relationship between diagnosis and achievement across groups of children, Table 4.1 reports the estimated coefficients from the math models with the interaction terms between social class, race/ethnicity, and mental health diagnoses (note the full sample of children were used). Model 4 presents the estimated results from the parental

educational attainment interactions, and the reference group is children whose parents had attained a high school diploma or less. The association between mental health diagnosis and math achievement was negative for children who had the least educated parents: children diagnosed with ADD/ADHD and ED experienced declines of nearly 5 points and 4 points in math, respectively, if their parents had attained a high school diploma or less. However, as parents' education level increased the negative association between diagnosis and math achievement decreased in an incremental fashion. For children whose parents had a post-graduate education level (e.g., the most education), an ADD/ADHD diagnosis was unrelated to math achievement (-4.83 + 4.94 = 0.11). The pattern was even more prominent for ED diagnosed children: parental education beyond high school graduation meant that the diagnosis was positively associated with achievement. For instance, the interaction-corrected association between ED diagnosis and math achievement for children whose parents had some college experience was 1.37 points (-3.84 + 5.21 = 1.37), and the benefit for children whose parents had a bachelor's degree was 3.0 points (-3.84 + 6.84 = 3.0).

Model 5 includes the interaction terms between race/ethnicity and mental health diagnosis, and although there are not as many significant interaction terms, a similar pattern of social advantage begetting advantage was observed. For children diagnosed with ADD/ADHD, white children experienced the least negative association with math achievement (b = -2.25), whereas African American children experienced a decline of nearly 8 points when diagnosed (-2.25 + -5.53 = -7.78). For ED diagnoses, the association between diagnosis and achievement was marginally positive but only for white children, and the association for both African American and Hispanic children

trended negative, although neither race/ethnicity interaction coefficient was statistically significant.

Model 6 includes the interaction terms for parental educational attainment and race/ethnicity simultaneously. The interaction coefficients for parents' education remain largely unchanged, and continue to show the pattern whereby diagnoses are less negatively associated with achievement for children with more educated parents. In contrast, the interaction coefficients for African American and Hispanic children were diminished; suggesting that part of the explanation for the interaction patterns observed in Model 5 resulted from the overlap of race/ethnicity with disadvantaged social class position (e.g., less educated parents). Nevertheless, a significant negative interaction effect was observed for African American children diagnosed with ADD/ADHD predicting math achievement.

Finally, Model 6A re-estimated Model 6 with the comparison group restricted to include only children who were evaluated for a mental health problem. Results of Model 6A show two important patterns. First, the size of the negative coefficients for the reference group was reduced, and second, the coefficients for the interaction terms were generally unchanged. The estimated coefficients for the interaction terms in Model 6A are nearly identical to the coefficients from Model 6; therefore, a similar pattern of "less negative consequences" (i.e., double disadvantage) persists in the restricted sample comparison. In combination with the less negative estimated coefficients for the reference group, the interaction coefficients indicate that the positive associations between diagnosis and achievement are more pronounced in the evaluation-only model. For instance, ADD/ADHD diagnosis is no longer unrelated to math achievement for

children with the most educated parents, but shows a slightly positive association with achievement of 2.24 points (-1.75 + 3.99 = 2.24).

Table 4.2 presents the models with the interaction terms included estimating children's reading achievement. In general, similar patterns were observed for the reading models as for the math models. ED diagnoses for children with more educated parents continued to be either unrelated or positively related to achievement. Additionally, white children continued to experience the least negative consequences associated with mental health diagnoses, and restricting the sample to only evaluated children once again reduced the size of the negative coefficient for the reference group without substantively altering the estimated coefficients of the interaction terms. The reading models did differ from the math models with regards to the interaction terms between parental educational attainment and ADD/ADHD. Unlike the stair-step decrease in the negative association between diagnosis and achievement found in the math models, all children whose parents had attained more than the least amount of education were benefited by an ADD/ADHD diagnosis.

In some ways, Tables 4.1 and 4.2 complement the findings from the main effects models reported earlier. In accordance with the main effects models, mental health diagnoses do appear to be negatively associated with children's math and reading achievement. However, models containing interaction terms provide an important qualifier to this association: the negative association between diagnosis and achievement is predominantly experienced by disadvantaged children from working-class backgrounds and, in some instances, racial/ethnic minority children. In this regards, the evidence indicates that mental health diagnoses conform to the pattern of double disadvantage for

children's academic achievement. The interaction terms reveal important inequalities in the consequences of diagnoses. Children from more advantaged family backgrounds (i.e., children with more educated parents) were protected against the decline in academic achievement associated with diagnosis that was experienced by disadvantaged children. Moreover, after adjusting the comparison group to include only evaluated individuals, children with more educated parents were generally expected to receive a positive gain from diagnosis whereas less advantaged children were still faced with a modest decline in their achievement. Thus, while children were not shielded against being diagnosed, social class was able to alter the consequence associated with it. To a lesser extent, a similar pattern was observed for children from different racial/ethnic groups. Accordingly, mental health diagnoses act in unison with children's positions within the social hierarchy to provide additional advantage to the already advantaged, and perpetuate disadvantage among the presently disadvantaged.

[Insert Table 4.1 about here]

[Insert Table 4.2 about here]

Discussion

The proportion of children diagnosed with mental health problems, particularly ADD/ADHD and ED, has grown rapidly over the last two decades. As the number of children experiencing mental health diagnoses continues to rise, so too does the importance of understanding the consequences associated with these diagnoses for children's development. Of particular importance, given its implications for later life success, is the association between diagnosis and academic achievement. Prior research has typically examined the association between symptoms of mental health and academic

achievement, and education researchers have provided some evidence that diagnosis may be negatively related to achievement, but these conclusions are primarily based on analyses using small samples or data that does not permit easy comparison. Furthermore, previous research has not explored whether the association between diagnosis and achievement is the same for all groups of children. This project thus examines the consequences of mental health diagnoses for children's academic achievement and whether the association varies across race/ethnicity and social class, to determine if social background alters the relationship.

In general, there was some evidence that mental health diagnoses were related to academic achievement independent of mental health symptoms, social class, race/ethnicity, and a range of other family and social factors. For example, on average, children diagnosed with ADD/ADHD experienced a decline in their reading scores. Conversely, ED diagnoses were related to changes in children's math scores; however, instead of showing a decline, ED diagnosis was associated with a slight increase. Additionally, the association between ED and reading scores was reduced to non-significance once mental health symptoms, social class, and race/ethnicity were considered. Thus, diagnoses seem to partially matter for the achievement of diagnosed children, but the association is not consistently negative, and these general trends mask substantial variability in group-specific relationships.

The association between diagnosis and achievement was moderated by children's social background. In line with the double disadvantage argument, mental health diagnoses were most negatively associated with academic achievement for the least advantaged children. On the reverse side, children whose parents were most educated

often experienced a positive boost from diagnosis relative to their non-diagnosed peers. Furthermore, in an incremental fashion, the negative association between diagnosis and achievement was reduced as children's statuses increased.

Prior research has often reported situations in which advantage alters the consequences for individuals, as advantage begets additional advantage. Gaining historical notoriety from Merton's (1968) work on the perpetuation of science careers, this social phenomenon, often referred to as the "Matthew Effect", is the process through which individuals with more resources tend to use those resources to gain increasingly more and more, while individuals without resources gain less and the disparity between grows. Double disadvantage offers the mirror image of the Matthew Effect, whereby disadvantage begets additional disadvantage.

Generally, the Matthew effect is used to discuss processes through which advantaged individuals gain more from their resources. For example, Hearn (1991) examined the role of academic and non-academic factors in predicting the prestige of postsecondary institution attended. He found that individuals with equal levels of academic skills were more likely to go to a prestigious university if they came from a more socioeconomically advantaged family. Thus, adolescents from more advantaged families were able to derive greater benefit from their academic skills thereby providing evidence of unbalanced consequences of mental health diagnoses. Additional research has shown how individuals' social status can reduce negative consequences. For instance, work in the field of criminology has shown that children's social backgrounds can protect them against the consequences of juvenile delinquency, by reducing the negative repercussions of deviant behavior (Hagan 1991). Similarly, this study showed

that mental health diagnosis was negatively related to academic achievement, but primarily for children from disadvantaged social backgrounds. Children from more advantaged families were largely immune from the negative association between diagnosis and achievement. Yet, the findings herein suggest an usual dimension of "double disadvantage" or a skewed form of the "Matthew Effect", whereby social advantage was able to create advantage through a medium typically expected to carry negative consequences for children. Middle class children did not simply receive less negative consequence from a diagnosis, but experienced an increase in their math and reading skills from being diagnosed.

This positive benefit is somewhat surprising, given that mental health diagnoses are not considered desirable nor do they carry inherent value as a resource aiding in children's development. Although mental health diagnoses have been described as a "double-edged sword", because they carry a legitimated status that provides individuals with access to services not otherwise available. The term double-edged sword nevertheless still implies that diagnoses have negative consequences for the diagnosed. Indeed, the results show evidence that diagnoses are detrimental to children's academic achievement, and while it is not possible to conclude that the consequences associated with diagnoses for working class children are the typical experience, it at least provides evidence that diagnoses can be academically costly. Thus, beginning from the premise that mental health diagnoses can be negatively related to children's academic achievement, the evidence that more advantaged children do not experience this same detriment suggests that social advantage is able insulate against the potentially deleterious effects of diagnosis, and in some cases actually convert it into a positive.

This creation of benefit when loss might otherwise be anticipated is unusual, but serves as further evidence of how social advantage can be perpetuated through several dimensions of children's lives, including their mental health problems.

Presented findings point to an important effect of social class (and to some extent race/ethnicity) on the consequences of diagnoses for academic achievement. Future research can examine these associations in more depth. The intention here was to provide a useful description of the inequalities in the consequences of children's diagnoses, but this does not provide insight into why these differences occur. What might be the mechanisms at work that explain the negative consequences experienced by disadvantaged children? Some research has suggested that children diagnosed with mental health problems are particularly hindered by their school setting (Trout et al. 2003; Wehby, Lane and Falk 2003), as diagnosed children are more likely to be placed in separate classrooms or given services that help them manage their behaviors and emotions but at the neglect of academic instruction. It could be that disadvantaged children are particularly susceptible to experiencing substandard schooling and classroom conditions thus contributing to the negative relationship between diagnosis and achievement. Unpacking the mechanisms through which disadvantaged children experience the strongest consequences from mental health diagnoses will help further explain a complicated social process, as well as possibly inform interventions aimed at helping children.

Of more immediate concern for the present study are issues related to measurement reliability. Specifically, parent reports of the presence and timing of children's mental health diagnoses were used, therefore response bias and recall error

could influence the findings. Future research able to verify the existence or non-existence of a diagnosis will help either validate or correct conclusions drawn from this study. Similarly, the use of multiple informants to measure children's mental health symptoms introduced additional uncertainty in the model, which can only be resolved through better measurement by future researchers. Despite these areas for improvement this project uses some of the best available data to track the association between children's mental health diagnoses and academic achievement, and provides important information regarding the intersection of mental health and social stratification in the academic careers of children.

Mental health diagnoses are typically thought of as having negative consequences for children, however this conclusion is mainly based on small samples and larger samples with limited capacity for comparison. Using a large, nationally representative sample of children I find that mental health diagnoses are negatively associated with academic achievement, but primarily for the most disadvantaged children. In line with the double disadvantage model, children from disadvantaged families experienced the largest declines in their achievement associated with diagnosis, while more advantaged children were able to buffer these negative effects, and in some cases actually receive a benefit from diagnosis. These results speak to the ability of social advantage to propagate itself in the lives of children, and create benefit where detriment would otherwise be expected, thereby contributing to academic disparities, and potentially setting into place the foundations for the next generation of social inequality.

Table 1. Descriptive Statistics for Time Invariant Variables by Diagnosis Status

	Non-Diagnosed (n ~ 14,800)		ADD/ADHD (n ~ 1,120)		ED (n ~ 830)	
	Mean	SD	Mean	SD	Mean	SD
Parental Educational Attainment						
High school diploma or less	.30	.46	.28	.45	.24	.43
Some college	.35	.48	.39	.49	.37	.48
Bachelor's degree	.21	.41	.20	.40	.22	.42
Post-graduate work	.14	.34	.13	.33	.16	.37
Race/Ethnicity						
White	.56	.50	.72	.45	.70	.46
African American	.16	.37	.12	.32	.09	.28
Hispanic	.20	.40	.11	.31	.17	.37
Asian	.03	.18	.00	.06	.00	.06
Other	.05	.21	.05	.22	.04	.21
Control Variables						
Child Characteristics						
Female	.51	.50	.26	.44	.39	.49
Age (in months)	74.73	4.38	74.91	4.93	75.06	4.48
Family Structure/Resources						
Northeast	.18	.38	.17	.38	.22	.41
Midwest	.23	.42	.27	.44	.28	.45
South	.38	.48	.44	.50	.31	.46
West	.22	.41	.12	.33	.19	.39
City	.37	.48	.33	.47	.32	.47
Suburban	.41	.49	.41	.49	.45	.50
Rural	.21	.41	.26	.44	.24	.42

Table 2.1. Descriptive Statistics for Measures of Academic Achievement by Diagnosis Status

		K	Grade 1	Grade 3	Grade 5	Grade 8
		Reading Score				
Non-Diagnosed	Mean	46.63	77.89	127.53	150.96	171.87
	SD	13.39	23.42	27.65	25.74	26.76
ADD/ADHD	Mean	41.50	67.25	115.14	138.93	155.53
	SD	10.76	21.51	28.82	28.42	31.94
ED	Mean	44.24	72.44	121.77	145.97	165.30
	SD	12.59	23.73	29.06	27.92	29.54
		Math Score				
Non-Diagnosed	Mean	36.58	61.76	99.74	124.59	143.09
	SD	11.92	17.88	24.35	24.17	21.32
ADD/ADHD	Mean	31.76	54.26	88.80	113.18	130.14
	SD	10.21	17.32	25.38	27.35	24.87
ED	Mean	34.28	57.55	94.57	119.28	137.97
	SD	10.75	17.24	24.16	25.76	23.24

Table 2.2. Kingergarten Wave Values for Time-Varying Covariates by Diagnosis Status

	Non-Diagnosed/ non-evaluated		ADHD		ED	
	Mean	SD	Mean	SD	Mean	SD
Mental Health Symptoms						
Interanlizi	3.47	.29	3.33	.34	3.30	.34
Externaliz	3.25	.45	2.71	.57	2.94	.58
Attentiver	3.12	.41	2.74	.40	2.91	.45
Child Characteristics						
Health Sc	4.31	.80	4.18	.89	4.11	.92
Grade Ret	.06	.24	.09	.29	.08	.27
Family Structure and Resources						
Two-Biol	.67	.47	.54	.50	.57	.50
Siblings	1.50	1.17	1.37	1.10	1.41	1.05
Neighborh	2.60	.46	2.63	.42	2.61	.44
Income	63.07	54.64	58.76	50.00	63.76	55.92
Number o	70.50	58.86	76.42	58.91	83.59	60.33
Residentia	.63	.48	.69	.46	.68	.47
Family Processes						
Parental S	4.14	1.73	4.33	1.59	4.38	1.64
Parent-to-	2.23	2.99	1.69	2.66	2.13	3.06
Child Acti	1.03	1.14	.99	1.02	1.17	1.18
High Cult	1.06	.96	1.00	.90	1.10	.95
Family Rc	3.67	1.09	3.69	1.02	3.65	1.09
Parental V	3.08	1.08	2.92	1.09	2.83	1.18
Parental D	1.44	.45	1.57	.50	1.61	.52
Parent-Ch	2.77	.50	2.75	.48	2.77	.51
Educatior	.76	.42	.65	.48	.70	.46
Spank	.80	.40	.83	.37	.80	.40
Discuss w	.75	.44	.73	.44	.72	.45

Table 3.1. HLM Growth Curve Analysis of Children's Math Scores (selected results)

	Model 1		Model 2		Model 3		Model 3A	
	b	SE	b	SE	b	SE	b	SE
Mental Health Diagnoses								
ADD/ADHD	-3.44 ***	0.48	-2.67 ***	0.48	-2.98 ***	0.46	-0.77	0.47
ED	0.33	0.59	0.71	0.60	0.72	0.60	1.72 **	0.62
Time	25.22 ***	0.07	26.04 ***	0.08	25.43 ***	0.09	23.96 ***	0.22
Time sq	-1.57 ***	0.01	3.80 ***	0.15	-1.59 ***	0.01	-1.46 ***	0.03
Intercept	36.32 ***	0.11	9.28 ***	0.70	9.70 ***	1.12	15.11 ***	2.35
Control Variables								
Primary Controls	No		Yes		Yes		Yes	
Secondary Controls	No		No		Yes		Yes	
Evaluated Children ONLY	No		No		No		Yes	
n (sample size)	~16,760		~16,760		~16,760		~2,900	

*** p<0.001, **p<0.01, *p<0.05

NOTE: Analyses are weighted and adjusted for sample design effects. All analyses control for the following background characteristics:

NOTE: Primary controls include parental educational attainment, race/ethnicity, and mental health symtpoms. Secondary controls include the three sets of variables: child characteristics, family structure/resources, and family processes. Evaluated children only means that only children who were either evaluated or diagnosed are included in the analysis.

Table 3.2. HLM Growth Curve Analysis of Children's Reading Scores (selected results)

	Model 1			Model 2			Model 3			Model 3A		
	b		SE	b		SE	b		SE	b		SE
Mental Health Diagnoses												
ADD/ADHD	-5.68	***	0.62	-4.05	***	0.61	-3.85	***	0.59	-1.68	**	0.61
ED	-1.48	*	0.72	-0.89		0.70	-0.78		0.70	0.69		0.74
Time	32.15	***	0.09	33.12	***	0.09	32.46	***	0.11	30.46	***	0.27
Time sq	-2.15	***	0.01	-2.29	***	0.01	-2.21	***	0.02	-2.01	***	0.03
Intercept	45.95	***	0.14	9.13	***	0.89	7.10	***	1.42	14.01	***	3.07
Control Variables												
Primary Controls	No			Yes			Yes			Yes		
Secondary Controls	No			No			Yes			Yes		
Evaluted Children ONLY	No			No			No			Yes		
n (sample size)	~16,630			~16,630			~16,630			~2,890		

*** p<0.001, **p<0.01, *p<0.05

NOTE: Analyses are weighted and adjusted for sample design effects. All analyses control for the following background characteristics:

NOTE: Primary controls include parental educational attainment, race/ethnicity, and mental health symtpoms. Secondary controls include the three sets of variables: child characteristics, family structure/resources, and family processes. Evaluated children only means that only children who were either evaluated or diagnosed are included in the analysis.

Table 4.1. HLM Growth Curve Analysis of Children's Math Scores with Across Level Interactions (selected results)

	Model 4		Model 5		Model 6		Model 6a	
	b	SE	b	SE	b	SE	b	SE
Mental Health Diagnoses								
ADD/ADHD								
Reference Group	-4.83 ***	0.85	-2.25 ***	0.53	-4.16 ***	0.91	-1.75 ~	0.89
x Some College	1.39	1.12			1.41	1.11	1.33	1.10
x Bachelor's degree	3.49 **	1.32			3.22 *	1.32	3.27 *	1.29
x Post-graduate work	4.94 **	1.62			4.52 **	1.60	3.99 *	1.60
x African American			-5.53 ***	1.27	-4.86 ***	1.31	-5.28 ***	1.28
x Hispanic			-0.83	1.47	-0.06	1.48	-0.73	1.46
ED								
Reference Group	-3.84 **	1.23	1.10 ~	0.66	-3.60 **	1.32	-2.73 *	1.32
x Some College	5.21 **	1.55			5.03 **	1.56	5.06 **	1.53
x Bachelor's degree	6.84 ***	1.70			6.57 ***	1.73	7.04 ***	1.73
x Post-graduate work	6.09 **	1.93			5.81 **	1.93	5.92 **	1.91
x African American			-3.22	2.17	-1.71	2.14	-1.55	2.07
x Hispanic			-1.01	1.82	0.19	1.77	0.21	1.74
Time	25.43 ***	0.09	25.43 ***	0.09	25.43 ***	0.09	23.94 ***	0.22
Time sq	-1.59 ***	0.01	-1.59 ***	0.01	-1.59 ***	0.01	-1.45 ***	0.03
Intercept	9.81 ***	1.12	9.68 ***	1.12	9.80 ***	1.12	15.42 ***	2.35
Control Variables								
Primary Controls	Yes		Yes		Yes		Yes	
Secondary Controls	Yes		Yes		Yes		Yes	
Evaluation Children ONLY	No		No		No		Yes	
n (sample size)	~16,760		~16,760		~16,760		~2,900	

*** p<0.001, **p<0.01, *p<0.05

NOTE: Analyses are weighted and adjusted for sample design effects. All analyses control for the following background characteristics:

NOTE: In Model 4, the reference group are children whose parents' educational attainment was a high school diploma or less, for Model 5 the reference group is white children, and for Model 6 and 7 the reference group is white children whose parents had a high school diploma or less.

NOTE: Primary controls include parental educational attainment, race/ethnicity, and mental health symtpoms. Secondary controls include the three sets of variables: child characteristics, family structure/resources, and family processes. Evaluated children only means that only children who were either evaluated or diagnosed are included in the analysis.

Table 4.2. HLM Growth Curve Analysis of Children's Reading Scores with Across Level Interactions (selected results)

	Model 4		Model 5		Model 6		Model 6a	
	b	SE	b	SE	b	SE	b	SE
Mental Health Diagnoses								
ADD/ADHD								
Reference Group	-4.21 ***	1.06	-2.89 ***	0.66	-3.09 **	1.09	-0.80	1.09
x Some College	-1.19	1.42			-1.34	1.41	-1.28	1.42
x Bachelor's degree	3.06 ~	1.66			2.51	1.64	2.74 ~	1.66
x Post-graduate work	1.95	1.96			1.21	1.93	0.22	2.04
x African American			-6.07 **	1.70	-5.55 **	1.72	-5.25 **	1.73
x Hispanic			-2.56	1.97	-2.16	1.96	-3.06	1.96
ED								
Reference Group	-5.64 **	1.55	-0.22	0.79	-5.02 **	1.60	-3.79 *	1.62
x Some College	5.73 **	1.84			5.42 **	1.83	5.55 **	1.81
x Bachelor's degree	5.03 *	2.14			4.51 *	2.13	5.02 *	2.16
x Post-graduate work	8.95 ***	2.37			8.39 **	2.39	8.57 **	2.39
x African American			-4.67 ~	2.62	-3.25	2.66	-2.36	2.67
x Hispanic			-1.46	1.97	-0.44	1.88	-0.43	1.86
Time	32.46 ***	0.11	32.46 ***	0.11	32.46 ***	0.11	30.46 ***	0.27
Time sq	-2.21 ***	0.02	-2.21 ***	0.02	-2.21 ***	0.02	-2.01 ***	0.03
Intercept	7.19 ***	1.42	7.01 ***	1.42	7.10 ***	1.42	14.05 ***	3.07
Control Variables								
Primary Controls	No		Yes		Yes		Yes	
Secondary Controls	No		No		Yes		Yes	
Evaluated Children ONLY	No		No		No		Yes	
n (sample size)	~16,630		~16,630		~16,630		~2,890	

*** p<0.001, **p<0.01, *p<0.05

NOTE: Analyses are weighted and adjusted for sample design effects. All analyses control for the following background characteristics:

NOTE: In Model 4, the reference group are children whose parents' educational attainment was a high school diploma or less, for Model 5 the reference group is white children, and for Model 6 and 7 the reference group is white children whose parents had a high school diploma or less.

NOTE: Primary controls include parental educational attainment, race/ethnicity, and mental health symtpoms. Secondary controls include the three sets of variables: child characteristics, family structure/resources, and family processes. Evaluated children only means that only children who were either evaluated or diagnosed are included in the analysis.

Appendix A: Control Variable Construction

Child Characteristics

Children's *gender* is based on the composite measure from the ECLS-k that provided information on the sex of the child. Values were coded 1 = female and 0 = male. Children's *age* in kindergarten was used as a time-invariant measure, because it is based on the age of the child at the time of the kindergarten assessment. Therefore, across subsequent waves a time-varying measure of age and the "time" indicator would be perfectly collinear creating problems in estimation. *Grade retention* was computed by tracking children's school progressions across waves. For each wave a child was at the expected grade level or beyond (e.g., during the fifth round of data collection children were typically in the third grade, so "at grade level or beyond" means that children were either in the third grade or some more advanced grade) they received a 0, and if a child was behind a grade they received a value of 1. Children were only scored a 1 for the first wave in which they reported being below grade level. Finally, *health* is based upon a parent report of children's overall health, and could take on a value of 0 = poor to 5 = excellent.

Family Structure and Resources

Two biological parents was measured according to parent reports of their current "partner" situation. If both biological parents were reported to be living in the household, then the child received a value of 1; any other configuration received a value of 0. This value is time-varying, which means it could change across waves depending on the composition of the family. Since the measure considered simply the presence of two-biological parents, it does not distinguish between parents who were married and parents

who may have been cohabiting. *Neighborhood quality* is a composite measure based upon reports related to the community in which the school was located. School administrators were asked to report on the degree of gang presence, littering, vacant buildings, and drug use in the community around the school on a scale of 1 = big problem to 3 = no problem. Answers on these four items were averaged together to create an overall measure of neighborhood quality.

Family income was created from the ECLS-k categorical measure of income and converted into dollars by taking the middle value of each category. For example, if an individual reported their income as a category 9, "between $40,000 and $50,000", I substituted in the middle value of $45,000. This process of substitution was repeated for each wave of the study, except for the Kindergarten wave where family income was already reported as an interval measure. The continuous measure of income was adjusted for inflation and divided by 1000 to increase the relative size of the coefficient. Number of *books in the household* is based on parent report of how many children's books the family owned and/or had borrowed from a library. *Residential mobility* is a measure based upon parent reports of the number of places children have lived. If children lived in more than one location since the date of the last interview, they received a value of 1, and otherwise received a value of 0. For kindergarten, if a child had lived in more than one place prior to attending school they received a value of 1.

Family Processes

Parental school involvement is a measure of the extent to which parents were involved with their children's school. In total, seven questions were used to create the count variable (parental school involvement items: contacted school, parent-teacher

conference, open house, PTA meeting, volunteered at school, attend school event, and fundraising efforts). In the first six waves of the study, answers to these questions were dichotomous (1 = yes, 0 = no), however for the final wave parents were given the third option of "no opportunity yet." Any answer of "no opportunity yet" was recoded to reflect the probability of involvement based on parental responses in prior survey years. Responses were then added together, so that the variable could take on a value between 0 and 7. *Parent-to-parent communication* is based on parent reports of the number of their child's friends' parents they know.

The measure of *child's activities* is based on children's participation in extra-curricular, leisure time activities. During the first six waves of the study, parents were asked if their child participated in six activities (dance, music lessons, athletic team, performance group, organized club, or arts and crafts), and in the final wave of the study children were asked to self-report participation in six activities (school club, school sports team, school drama, arts and crafts class, non-school sports, or organized club).[5] Participation in an activity was coded as 1 and non-participation as 0. Responses were then added together, so that at each wave the variable could take on a value between 0 and 6.

Participation in *high culture activities* is a count measure from kindergarten and grade 3, of whether children attended a musical concert, visited a museum, or visited a zoo. Each affirmative response was coded as 1, and then summed together so the

[5] Changes in question wording and respondent (parent vs. child) in 8th grade have resulted in slightly lower correlations of child activities with previous waves. However, the gap between 5th and 8th grades contains an extra year, compared to previous waves, and 8th grade parenting measures (which were asked consistently) also show lower correlations with previous years suggesting that there may be a qualitative shift between these years.

variable could take on a value between 0 and 3. *Family routines* is a count measure based on the consistency of certain activities in children's households; specifically, whether the children ate breakfast at the same time five or more days a week, ate breakfast as a family five or more days a week, ate dinner at the same time five or more days a week, ate dinner as a family five or more days a week, and went to bed at a regular time. Affirmative responses were coded as 1, and then summed together so that the values ranged from 0 to 5.

Parental warmth is based on a question asked of parents in kindergarten and grade 3 about if they often spent warm or close times together with their children. Values could range from 1 = not at all true to 4 = completely true. *Parental depressiveness* is a composite measure based upon 12 questions asked of parents in kindergarten, grade 3, and grade 8. Parents were asked to report how often they felt unusually bothered, had a poor appetite, felt inconsolably sad, had trouble focusing, felt depressed, sensed that everything took more effort than usual, felt fearful, slept restlessly, talked less than usual, felt lonely, felt sad, and could not get going. Parents could respond on a scale of 1 = Never to 4 = Most of the time. Answers were averaged to created composite measures of parental depressiveness, with higher scores indicating higher levels of depressiveness.

Parent-child activities is based upon parent-report of how often they do different activities with their children. Questions about parent-child activities were asked in every wave except for grade 5. In kindergarten, grade 1, and grade 3, parents were asked how often they did the following activities with their children: played games, talked about nature, built things, played sports, and made art. In grade 8, the list of activities changed to reflect developmentally relevant activities, such as working on a hobby together,

shopping, eating at a restaurant, talking together, and watching TV together. Parents could report that they did these activities with their children 1 = Never through 4 = Frequently. Responses were averaged together at each wave to create a composite of parent-child activities.

Parental educational expectation was based on parent-reports of how much schooling they expect their children to receive. Responses could originally vary from 1 = less than a high school diploma thru 6 = PhD, MD, JD, or other professional degree; however, the vast majority of respondents expected their children to receive a bachelor's degree or more. Therefore, the variable was recoded so that expecting a bachelor's degree or more was coded as a 1, and all other responses were coded as 0. This measure was allowed to vary over time to allow for changes in parents expectations, and the implications such changes might have for children's math and reading achievement. Finally, two measures of discipline strategy, *spanking* and *discuss with children*, reflect parent responses to questions regarding how frequently parents spank their children, which was asked in kindergarten, grade 3, and grade 5, and whether parents discuss what the child did wrong as a form of punishment, which was asked in every wave but grade 3.

Table A1. Classification of Time Invariant and Time-Varying Covariates		
Child Characteristics	**Family Structure and Resources**	**Family Processes**
Time Invariant Gender Age in kindergarten	*Time Invariant* Region Urbanicity	*Time Invariant*
Time Varying Health scale Grade retention	*Time Varying* Two biological parents Number of siblings Neighborhood quality Family Income Number of books Residential mobility	*Time Varying* Parental school involve Parent-to-Parent Child activities High culture activities Family routines Parental warmth Parental depressiveness Parent-child activities Educational expectations Spank Discuss what did wrong

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Chapter 4. Parenting, Classroom Quality, and the Association between Cumulative Childhood Experiences, Mental Health Diagnoses, and Academic Achievement

Children with mental health diagnoses, such as attention-deficit/hyperactivity disorder (ADHD) or an emotional disturbance (ED; e.g., depression, anxiety, phobias) tend to do less well in school than their non-diagnosed peers. Relatively speaking, diagnosed children score lower on assessments of academic skills and are more likely to drop-out of high school and complete fewer years of schooling (Barkley et al. 1990; Blackorby and Wagner 1996; Eisenberg and Schneider 2007; Frazier et al. 2007). Still, it is unclear why these children are worse off academically. Some research has suggested that diagnosed children perform less well because of the symptoms related to their mental health problem—that is, the emotional issues and behavioral problems consistent with diagnoses inhibit children's ability to learn at school and in the classroom (for discussion, see Trout et al. 2003). Such an explanation downplays the significance of social context for children's outcomes, and focuses instead on the individual. In comparison, other research has identified changes to the family and schooling context of diagnosed children as importantly contributing to their diminished educational outcomes.

According to this second line of research, the excessive energy, low self-control, and unexpected mood swings of children with ADHD or ED place added strain on parents, and often create difficult and chaotic family circumstances (Anastopoulous et al. 1992). These behaviors and emotions additionally manifest themselves at school leading to classroom disruptions and strained teacher-student relationships, which can increase the likelihood that diagnosed children are placed in lower-quality classrooms where they are exposed to less beneficial instruction (Farmer and Hollowell 1994; Finegan 2004).

Mental health diagnoses thus set into motion processes that detract from the quality of children's family and/or schooling experiences, and these changes in children's context reduce learning and academic achievement. While this line of research offers a reasonable alternative to explanations focused on the individual (i.e., mental health symptoms), it typically limits consideration of changes to parenting practices and classroom quality that emphasize year-to-year differences thereby overlooking the importance of accumulated experiences in child development. More specifically, emerging evidence from the life course perspective has convincingly shown that children's outcomes tend to reflect conditions and experiences that occur over time rather than particular events or episodes at any particular point-in-time (Duncan, Brooks-Gunn and Klebanov 1994; Gerard and Buehler 2004). Accordingly, children's mental health diagnoses may matter because of the disruption to children's long-term social context, and to understand how these accumulated processes matter requires cumulatively examining family and schooling experiences. Therefore, to extend prior studies focused on changes to social context associated with a diagnosis, I concentrate on children's cumulative family and schooling circumstances. The cumulative perspective, derived from the life-course perspective, captures children's exposure to accumulated parenting practices and classroom quality. By considering accrued experiences, the cumulative framework makes more explicit the process whereby children encounter similar conditions in the home and at school year-after-year, the change to these long-term family and schooling conditions associated with receiving a mental health diagnosis, and the influence these accumulated experiences have for children's development.

Additionally, to move past prior considerations of only the "main effect" association between diagnosis and achievement, I investigate the variability in the relationship that mental health diagnosis has with children's math and reading scores across social class. Children encounter diagnoses with access to unequal resources based upon their social background, and this disparity in resources is likely to contribute to variability in the consequences associated with diagnosis. Indeed, recent findings suggest that the negative association between mental health diagnoses and academic achievement is larger for less advantaged children (Potter 2011). Whether family and schooling factors are able to account for this differential association is unclear. There is considerable evidence that middle-class children experience beneficial parenting more frequently, and are placed in higher quality classrooms more often than their working-class/poor peers (Cheadle 2008; Condron 2008; Gamoran and Mare 1989; Lareau 2003). Less certain are the parenting and schooling of children at the intersection of mental health diagnosis and social class. It is possible that middle-class children are protected against the detrimental repercussions of diagnosis if their exposure to beneficial parenting and placement in quality classrooms remains high. Likewise, if ADHD or ED children from working-class/poor families experience particularly low quality parenting or classroom conditions, then these factors may help explain why such less advantaged children experience greater declines in academic achievement when diagnosed.

To investigate if family and schooling help account for the negative association between diagnosis and achievement, and whether these factors additionally explain the differential association across social class, I use data from the Early Childhood Longitudinal Study – Kindergarten cohort (ECLS-k). I first estimate the association

between diagnosis and achievement, net of sociodemographic characteristics and mental health symptoms. Presented results suggest that children diagnosed with ADD/ADHD experienced declines in their reading and math scores, while ED diagnoses were unrelated or slightly positively associated with achievement. Next, I used concurrent measures of parenting and classroom quality (i.e., cotemporaneous, time-varying measures that emphasize temporally-independent change over time and its association with the outcome variable) to determine if these factors account for the gaps in achievement associated with diagnosis. Concurrent family and schooling experiences do not explain the lower performance of ADD/ADHD children. However, cumulative measures (i.e., accumulated, time-varying measures that emphasize temporally-dependent change and its association with the outcome variable) were able to explain most of the lower performance of diagnosed children. The findings thus suggest that changes in long-term parenting practices and classroom quality contribute to the negative association between ADD/ADHD and achievement.

Finally, to determine if family and schooling conditions accounted for the differential association between diagnosis and achievement, I estimated the relationship between ADD/ADHD, ED, and math and reading scores moderated by social class. The findings indicate that mental health diagnoses were more negatively associated with academic achievement for less advantaged children (i.e., children with the less educated parents). Concurrent and cumulative family and schooling experiences were investigated to try and explain the differential association. Similar to the patterns of the "main effect" model, concurrent measures did not explain the variability in the negative association of diagnosis with achievement across social class; however, the cumulative measures did.

Cumulative parenting practices and classroom quality were able to account for nearly all of the differential association between diagnosis and children's math and reading scores related to parents' educational attainment (i.e., social class).

These findings suggest that cumulative family and schooling factors account for a large portion of the decline in achievement associated with ADD/ADHD and ED. That is, mental health diagnoses appear to alter the accumulation of parenting and classroom experiences over time, which contributes to diagnosed children's lower academic achievement. In contrast, measures of parenting and classroom quality that emphasized changes taking place separately from one year to the next (i.e., the concurrent measures), did not explain the gap in achievement associated with diagnosis. The cumulative family and schooling experiences also accounted for the differential association between diagnosis and achievement across social class, as middle class children experienced more beneficial parenting and classroom conditions independent of diagnosis status. Children from less advantaged families, on the other hand, tended to experience declines in long-term parenting practices and the quality of their classrooms when diagnosed, which further hindered achievement. Presented results lend support to cumulative focus in line with the life course perspective, as accumulated family and schooling circumstances either insulate children from or exacerbate further the consequences of mental health diagnoses for academic outcomes.

Literature Review

Children diagnosed with mental health problems, such as ADHD, depression, or anxiety, typically do less well in school than their non-diagnosed peers (Barkley et al. 1990; Blackorby et al. 2005; Bussing et al. 2010; Trout et al. 2003; Wehby, Lane and

Falk 2003). By the time children with mental health diagnoses reach middle school, their math and reading skills are on average a full academic year behind their non-diagnosed peers (Blackorby et al. 2005) and by high school these skill gaps have increased to more than 2 and 3 years in reading and math, respectively (Wagner et al. 2003). Further, nearly one-half of diagnosed students are 3 or more years behind in both math and reading, and nearly one-fifth are more than 5 years delayed in each subject. Therefore, and maybe not surprising given the academic skill deficits of diagnosed children, these youth have one of the lowest rates of high school graduation and similarly low rates of post-secondary enrollment (Blackorby and Wagner 1996; Bussing et al. 2010; Laird et al. 2007).

Despite the consistent evidence that children with mental health diagnoses perform less well in school, the reasons for this disparity remain unclear. Though some researchers have identified the symptoms associated with diagnoses as the primary culprit responsible for lower achievement (for literature review, see Wehby, Lane and Falk 2003), other studies have suggested that diagnoses matter for children's educational outcomes because of family and schooling experiences (Anastopoulous et al. 1992; Wehby, Lane and Falk 2003). Specifically, the emotional and behavioral displays associated with diagnoses, such as ADHD and ED, are associated with increased strain on parents and teachers. Consequently, beneficial parenting practices and placement in quality classrooms decline, which puts children in sub-optimal circumstances that detract from their academic success.

Parenting, Diagnosis, and Academic Achievement

Mental health diagnoses, such as ADHD or depression, are often indicative of severe behavioral and emotional problems, which can manifest themselves in many aspects of children's and their families' lives. Thus, parents of children with mental health diagnoses are often more stressed and strained in their parenting-efforts (Anastopoulous et al. 1992). For example, the erratic behavior of diagnosed children often makes it difficult to enroll them and keep them involved with extracurricular activities, such as sports and school clubs (Solish, Perry and Minnes 2010). Additionally, parents who want to be involved at their children's schools are more likely to be involved for negative reasons if their child is diagnosed. School involvement for parents of diagnosed children often involves meeting teachers and principals because of behavior problems resulting in parents feeling less welcomed and unsupported making it more difficult for them to participate in other capacities (Rogers et al. 2009).

Parenting tension is not limited to outside the home, however, as parent-child relations often become strained resulting in lower quality parent-child interactions as well as parent over-reactions in the family (Seipp and Johnston 2005). In an indepth-interview study of mothers of children with ADHD, Singh (2004) repeatedly had mothers express an added sense of frustration when working with their diagnosed children. One mother recalled how extreme her behavior became, as a result of the stress she felt from her son: "The smallest thing would make me upset and either drive me to the point of tears or make me start screaming uncontrollably. I'd shut the door to my room and go bang on something. Not a pretty sight" (Singh 2004, pg. 1198). Cronin (2004), in a similar study of mother's of children with "hidden diagnoses" such as ADHD and ED,

had numerous individuals echo the tale of chaos and strain associated with daily parenting practices. One mother described getting her son, Nathan, ready for school in the morning:

> We don't wake the kids up until quarter to 7. We leave the house at 7. And I say, "We've got to get these kids up earlier." And [my husband] says, "What for? We'd have to deal with [Nathan] all that much longer." We just get him up, we just deal with him for 15 minutes, and that's it. Get dressed, put your shirt on, put your shirt on. You know, you tell him, put your socks on….It's horrendous. Those 15 minutes. You know, you're screaming like an idiot, "You don't have your shoes on. I told you to get your shoes on." … You can wake him up at 6:15 and you still go through this. You just have 45 minutes of this. So I don't know. Yeah, the mornings are definitely the most horrendous. (Cronin 2004, pg. 89).

As can be gleaned from the words of these mothers, parents of children with mental health diagnoses often experience particular struggles, which can result in stress and strain and reduce the quality of interactions in the home, and additionally have repercussions for children's involvement in beneficial extracurricular activities, and investments of parents in their children's education. Thus, children's mental health diagnoses appear to detract from parenting quality.

However, the descriptions of these parents provide only a snap-shot in time, and while they allude to long-term problems, there is no explicit consideration given to the cumulative struggles faced by these children or their parents. "Nathan's" behavior may create problems for his parents now; however, ideas situated in the life course perspective suggest that such moment-in-time struggles are less important to consider than the accumulation of lower-quality parenting over time. In other words, it is less important to consider the isolated set of emotional over-reactions by parents, such as the descriptions of mothers in Singh's account (2004), than it is to situate parents' responses in terms of

their temporal continuity, i.e., consider how parents react to their diagnosed children over time. Research attempting to explain the lower academic performance of diagnosed children has typically relied on a "snap-shot" examination of parenting behaviors; thereby, overlooking the repercussions that accumulated, long-term parenting may have for understanding ADHD and ED children's outcomes.

Classroom Quality, Diagnosis, and Academic Achievement

Children's experiences at school are another important dimension of the social context that may contribute to lower academic performance. At school, children with mental health diagnoses tend to be surrounded by peers who themselves have academic deficits (LeFever, Dawson and Morrow 1999; Loe and Feldman 2007). For example, Farmer (1993) traced the academic careers of children with behavioral problems, and showed that higher levels of externalizing problems (e.g., inattentiveness, hyperactivity, and aggression) increased the likelihood that children would be placed in lower-ability classrooms, net of prior academic performance and other sociodemographic factors. Additionally, students with externalizing behavior problems in general education classrooms are more likely to associate with peers who are also disruptive and lower performing (Farmer and Hollowell 1994). Thus, diagnosed children are often in classrooms with lower-ability and more problem-behavior peers, which may detract from their academic gains.

The composition of classrooms attended by children with mental health diagnoses sets the foundation for a very challenging, and potentially stressful teaching situation. As might be expected, this stress can sometimes influence teachers' attitudes about teaching and perceptions of children's ability (Greene et al. 2002; Gunter et al. 1994). Teachers

often report feeling overwhelmed in their attempts to try and balance the needs of one or two students with special accommodations, and the needs of the rest of the classroom. In her dissertation, Finegan (2004) interviewed teachers about their experiences with diagnosed children, and although nearly all reported generally positive experiences, several also recalled the strain it placed on them and the other students in the class. For example, one teacher commented about children with emotional disturbances, and how "when you're constantly having to make sure you're meeting their modifications…there's times when you cannot meet the needs of regular ed kids" (Finegan 2004, pg. 145). Additionally, diagnosis status can alter teacher's perceptions and expectations of students' academic skills (Tournaki 2003). Teachers tend to be more tolerant, accepting, and understanding of lower performance by students with a documented diagnosis (e.g., ADHD, learning disability, depression); however, they also expect diagnosed children to continue to experience future academic failure more often than similarly performing, non-diagnosed children (Cook 2001). Mental health diagnoses thus have the potential to alter teachers' attitudes and perceptions of students' skills, in addition to placing children in classrooms that typically have lower instructional quality, which can detract from children's academic gains.

Finally, mental health diagnosis may reduce children's academic achievement if it keeps them out of school, and indeed, prior research indicates that diagnosed children tend to miss more school than their non-diagnosed peers (Blackorby et al. 2005). On average, children miss 1-2 days of school each academic year due to an illness, but individuals diagnosed with an emotional disturbance miss an average of 1-2 days of school *per month* (Blackorby et al. 2005). Diagnoses are thus associated with more

frequent school absences, which place children at a greater risk for academic struggles. However, like the research focused on parenting quality, most research has focused on "snap-shot" measures of diagnosed children's schooling circumstances thus overlooking long-term exposure to quality classroom environments. Thus, once again, a better understanding of how schooling contributes to ADHD and ED children's academic outcomes can be gained by considering accumulated experiences.

Cumulative Processes, Parenting Practices, Classroom Quality, and Academic Achievement

Family and school context may thus contribute to the lower academic achievement of children with mental health diagnoses but considering parenting and classroom quality at any single point in time is likely to be less important than recognizing the accumulated year-after-year circumstances. The importance of cumulative experiences is the basis of much research coming from the life-course perspective, which has made clear the importance of accrued experiences in shaping individual outcomes. Studies of cumulative risk, multiple family transitions, and chronic poverty have shown the added significance of considering children's accumulated exposures to their social context for understanding development (e.g., Duncan, Brooks-Gunn and Klebanov 1994; Gerard and Buehler 2004). Previous research has used this cumulative framework to study adolescent sexual behavior (Price and Hyde 2009) socio-emotional well-being (Dearing 2008; McLeod and Shanahan 1993), cognitive development (Kiernan and Huerta 2008; Klebanov and Brooks-Gunn 2006; Pike et al. 2006) and academic achievement (Pungello et al. 1996). For example, Duncan, Brooks-Gunn and Klebanov (1994), in a study on persistent poverty, found that 5 year-old

children who lived in poverty their entire lives had lower cognitive scores than their peers who had only experienced transient poverty (e.g., Duncan and Brooks-Gunn 2000; Duncan et al. 1998; Kiernan and Huerta 2008; McLeod and Shanahan 1993). Additional evidence of the importance of cumulatively examining children's experiences can be seen in the work of Cavanagh, Schiller, and Riegle-Crumb (2006), who found that children with multiple family transitions were less likely to be enrolled in advanced math courses and were more likely to drop-out of high school than children who experienced only a single change (see also, Sun and Li 2009).

According to the logic of the cumulative framework, considering the accumulated experiences of an individual captures something qualitatively different than looking at events separately over time (Duncan, Brooks-Gunn and Klebanov 1994; Rouse and Fantuzzo 2009; Sun and Li 2009). Cumulative measures situate cotemporary experiences within the temporal context of earlier events. The cumulative framework thus combines the past and present to understand human behavior and outcomes, and is here applied to the study of ADHD and ED children's accumulation of family and schooling experiences during childhood.

Parenting, Schooling, and Differential Effects of Diagnosis

Though a cumulative framework may better explain how family and schooling factors are associated with ADHD or ED children's lower academic performance, it still focuses primarily on the "main effect" of mental health diagnoses. Prior research typically treats diagnoses of ADHD or ED as if they mattered the same for every individual. Yet, mental health diagnoses are given to children from widely varying social backgrounds. Children thus encounter diagnoses with different types and levels of

resources at their disposal, which could alter the association between ADHD, ED, and achievement. Evidence from prior research indicates that diagnoses are more negatively associated with achievement for less advantaged children (Potter 2011); therefore, in addition to understanding the role of family and schooling factors in explaining the "main effect" of diagnosis, is inquiry into why the association between diagnosis and achievement varies across social class.

Parenting practices serve an important function in transmitting social class advantage between generations, and much has been written about the active and engaged parenting styles of middle-class parents in cultivating children's future success (Bourdieu 1990; Lareau 2003). Middle-class practices tend to encourage parent-child interactions in the home and use language games that teach children new and expanding communication skills (Bernstein 1960; 1971). Middle class parents are also more likely to enlist their children in numerous extracurricular activities, which often result in chaotic yet highly organized and planned weeknights and weekends (Lareau 2003). Finally, parents with more resources, including economic, social, and cultural capital (e.g., income, social connections, and knowledge of the school system) are more likely to be involved with their children's schooling by volunteering in the classroom, contacting the teacher, and participating on various parent committees (Dumais 2002; Lareau 2003; Sui-Chu and Willms 1996). These dimensions of parenting most prevalent in socially advantaged families thus work together to cultivate children's skills and have been shown to account for moderate portions of the academic achievement gap between middle- and working-class/poor children (Bodovski and Farkas 2008; Cheadle 2008; Dumais 2006). However,

left unexplored is the intersection of social class and mental health diagnoses, and the implications it has for parenting practices and children's academic achievement.

Parenting practices tend to differ across social classes, and as discussed above, mental health diagnoses tend to place an added strain on parents sometimes compromising the quality of practices, but does parenting differ across social classes for diagnosed and non-diagnosed children? For middle-class children who are diagnosed with a mental health problem: does middle class parenting prevail, or are parents' efforts diminished in light of children's mental health problems? For diagnosed children at the other end of the social class spectrum: are the parenting experiences of these children markedly lower than would be expected given their social status, and thus potentially account for the larger negative relationship between diagnosis and achievement? In essence, can parenting help explain the differential association that ADHD and ED have with children's math and reading achievement?

In a similar manner, schooling experiences may help account for the varying effects of diagnosis across social classes. Middle class children are more likely to be placed in "high ability" groupings in early elementary school (Condron 2008), and more advanced math courses in middle and high school (Riegle-Crumb and Grodsky 2010). Additionally, evidence over the past several decades suggests that children's social class is a strong and persistent predictor of formal and informal tracking (Gamoran 1992; Gamoran and Mare 1989; Lucas and Berends 2002), with social advantage increasing the likelihood of placement in advanced tracks.

Social class is additionally associated with teachers' positive expectations, attitudes, and perceptions of students' abilities and potential (Farkas 1996). For example,

Diamond, Randolph, and Spillane (2004) demonstrated that teachers held more positive views of their students and were more likely to emphasize students' attributes over their deficits at schools with fewer disadvantaged children. Since teacher's preconceived expectations and beliefs about students' abilities influence children's educational opportunities and outcomes (Rist 1970), middle class children typically benefit from those perceptions. More advantaged children are additionally benefited in terms of basic school attendance, as social class is inversely associated with days absent from school (Gottfried 2009). Thus, middle class children are disproportionately located in classrooms with peers who can contribute to their academic development, and create teacher-student relationships that are potentially rewarding in the learning experience. Consequently, middle class status situates children in particularly beneficial school settings; however, the link between social class and children's educational context has not been investigated in tandem with mental health diagnoses.

As discussed earlier, mental health diagnoses tend to place children at a disadvantage in schools; whereas, middle-class status improves the quality of educational experiences. Left unresolved are the classroom experiences of children at the intersection of the two. How does the overlap between social class and mental health diagnosis inform children's classroom experiences? Are middle class children with ADHD or ED protected from placement in the lower-quality classes that are typical of diagnosis? Conversely, are working-class/poor children with a mental health diagnosis at a greater risk for enrollment in lower-quality classrooms net of their expected placement given their social status? More simply stated: can classroom quality help explain why mental

health diagnoses are associated with larger declines in the academic achievement of less advantaged children?

Data and Methods

Data

To examine the role of family and schooling circumstances in accounting for the association between mental health diagnosis and children's academic achievement, this study uses data from the restricted-license data file of the Early Childhood Longitudinal Study – Kindergarten cohort (ECLS-k). The ECLS-k is a nationally-representative, seven-wave longitudinal-panel study that collected data on over 20,000 children during their Kindergarten year in the Fall of 1998, and followed them until Spring 2007 (Tourangeau et al. 2006). The original sampling design used a three-stage stratified random sample technique, which nested students in schools, and schools in counties. At each wave, data were collected from multiple informants to provide encompassing views of children's home and academic settings. Informants included the focal child, a parent, teacher, and school administrator, and provided information about children's physical development (e.g., height and weight), family environment (e.g., annual income, parenting practices, material resources), schooling environment (e.g., classroom quality, teacher characteristics), academic achievement (e.g., math, reading, and general knowledge/science assessments), and health. As part of the health data, questions were asked about children's physical (e.g., visual, hearing, and speech) and mental (e.g., learning, activity, and emotional) health diagnoses. I focus on the association between children's mental health diagnoses and academic achievement.

Measures

Academic achievement is measured using children's reading and math test scores. The ECLS-k directly assessed children's academic skills at each wave of the study using a two-stage testing procedure. In the first stage, children were given a set of subject-specific questions (i.e., reading or math) of varying difficulty, called routing questions. Based upon children's performance in the first stage, they received a second series of questions of low, medium, or high difficulty. ECLS-k programmers then used item response theory (IRT) to combine the two-stage assessment procedure, and provide children with a reading or math score. IRT uses the pattern of right, wrong, and omitted responses in combination with information on the difficulty and "guess-ability" of each test question to score students on a continuous scale. These scores are comparable between students, as well as across time for the same student regardless of the difficulty of the second-stage questions (Tourangeau et al. 2006).

Children's *mental health diagnosis* is based on parent reports indicating if children were diagnosed with ADD or ADHD (ADD/ADHD) or an emotional disturbance (ED, e.g., depression, anxiety, SED, etc.). If a parent reported that their child had been diagnosed, they were also asked to report the calendar year in which the diagnosis was received. Based on this information, I constructed a time-varying measure of mental health diagnosis that matched children's diagnosis status to each data collection wave.[1] Values for ADD/ADHD and ED were coded as 0 for waves in which children were non-diagnosed, and 1 for the first wave, and every subsequent wave, in which the

[1] Kindergarten wave included calendar years 1998 and 1999, Grade 1 wave included calendar year 2000, Grade 3 wave included calendar years 2001 and 2002, Grade 5 wave included calendar years 2003 and 2004, and Grade 8 wave included all calendar years greater than 2004.

diagnosis was registered. Thus, once children were diagnosed their status remained as such for the duration of the study, and only diagnoses obtained after children started school (e.g., calendar year 1998 or later) were included in the analysis.

Social Class. To measure children's social class, I used a proxy based on the highest level of education reported by either parent. Four categories representing qualitative breaks in attainment were created: high school diploma or less (reference group), some college experience, bachelor's degree, and post-graduate work.

Parenting Practices. I examine five measures of parenting practices: parental educational expectations, parent-child activities, parental school involvement, parent-to-parent communication, and child activities. *Parental educational expectation* was based on how much schooling parents expected their children to receive. Children whose parents expected them to receive a bachelor's degree or more were coded as 1, and all other levels of expectation (i.e., less than college completion) were coded as 0.

Parent-child activities is based on parent-report of how often they do certain activities with their children. Questions about parent-child activities were asked in every wave except for grade 5. In kindergarten, grade 1, and grade 3, parents were asked how often they did the following activities with their children: played games, talked about nature, built things, played sports, and made art. In grade 8, the list was changed to reflect age-appropriate activities, such as working on a hobby together, shopping, eating at a restaurant, talking together, and watching TV together. Parents could report that they did these activities with their children 1 = Never through 4 = Frequently. Responses were averaged together at each wave to create a composite of parent-child activities ($\alpha \sim 0.65$). Despite the change in questions between the earlier waves and grade 8 wave,

bivariate correlation comparison of the different waves revealed moderately-strong, positive associations over time, suggesting that these measures are comparable.

Parental school involvement measures the extent to which parents participated with or took part in various school groups and events. Parents reported if they contacted the school, attended parent-teacher conferences, open house, PTA meetings, school events, volunteered at school, or were involved with fundraising efforts. In the first six waves of the study, answers to these questions were dichotomous (1 = yes, 0 = no), however for the final wave parents were given the third option of "no opportunity yet." Any answer of "no opportunity yet" was recoded to reflect the probability of involvement based on parental responses in prior survey waves. Responses were then added together to create a count variable with values between 0 and 7. *Parent-to-parent communication* is based on parent reports of the number of their child's friends' parents they know (i.e., intergenerational closure).

Child's activities is based on children's participation in extra-curricular, leisure time activities. During the first six waves of the study, parents were asked if their child participated in dance, music lessons, athletic team, performance group, organized club, or arts and crafts, and in the final wave of the study, children were asked if they were involved with a school club, school sports team, school drama, arts and crafts class, non-school sports, or organized club.[2] Participation in an activity was coded as 1 and non-

[2] Changes in question wording and respondent (parent vs. child) in 8th grade have resulted in slightly lower correlations of child activities with previous waves. However, the gap between 5th and 8th grades contains an extra year, compared to previous waves, and 8th grade parenting measures (which were asked consistently) also show lower correlations with previous years suggesting that there may be a qualitative shift between these years.

participation as 0. Responses were then added together to create a count measure with values between 0 and 6.

Classroom Quality. There are five measures included in this study that capture different dimensions of children's classroom quality: classroom ability level, classroom behavior, teacher report of student skills, teacher's attitude about teaching, and school absences. *Classroom ability* is a teacher-report measure that captures the academic ability-level of students in the class with the focal child. In kindergarten and grade 1, teachers were asked to estimate separately the percent of students in their class with sufficient letter recognition, word recognition, and sentence recognition skills. In grade 3, teachers reported the percent of children who could read sentences, chapters, and chapter books at a satisfactory level. For each wave between kindergarten and grade 3, "classroom ability" was calculated by taking the mean of the three reported percentages (e.g., letter recognition, word recognition, and sentence recognition in kindergarten). In grades 5 and 8, teachers reported if their class was intended for students performing below grade level, at grade level, or was an advanced/honors course. During the fifth- and eighth-grade waves, about 20 percent of students were identified as belonging to classrooms with "instruction for students performing below grade level". I identified students in these "lower ability" classrooms using a dichotomous measure, and converted the "classroom ability" percent calculations from the earlier waves to a binary measure with children in approximately the lowest 20^{th} percentile classified as 1, and all higher values equal to 0. Classroom ability is thus coded such that 1 = low ability classroom, and 0 = non-low ability classroom. *Classroom behavior* is another measure based on teacher reports. During each wave of the study, teachers were asked to rate the behavior

of the students in their class, and these responses were recoded such that 1 = class misbehaves frequently or very frequently, and 0 = class misbehaves less than frequently.

Teachers also provided assessments of the focal child's proficiency on several academic skills, such as speaking, listening, reading comprehension, solving number problems, using math strategies, and data analysis. Teachers reported on different skills each wave to reflect age-appropriate academic tasks. ECLS-k programmers used teachers' responses about the unique tasks to create two continuous measures of children's teacher-assed math and reading ability, with higher scores indicating higher perceived skill proficiency. From these continuous measures, I created dummy variables of *student's skills* to identify the top 25 percent and bottom 25 percent of children. These "high" and "low" measures help classify children who are perceived by their teachers as being at opposite-ends of the skill spectrum.

An additional marker of classroom quality is *teacher's attitude* about teaching. Teachers, who are more optimistic about their role in the classroom and ability to make a difference in the lives of their students, are likely to try harder and make the extra effort for the children. Thus, teacher attitude can importantly influence classroom quality. To measure teacher attitude, I use a composite measure based upon teachers' responses to three questions: do they enjoy teaching, do they make a difference in children's lives, and would they choose teaching as a profession if they could do it again? Responses were coded such that higher scores indicated a more positive attitude, and then summed to create an interval measure ($\alpha \sim 0.72$). These composite measures were then converted to dummy variables indicating "high" and "low" teacher attitudes. Efforts were made to identify the top 25 percent and bottom 25 percent, but this was made difficult due the

limited range of values in the interval measure. As a result, the percent of children categorized in the "low" teacher's attitude group ranged between 28 and 40 percent across the different waves. The "high" teacher's attitude group was similarly affected, as the percent of students ranged from 22 to 42 percent across different waves.

Finally, classroom characteristics and experiences only matter if students attend class; therefore, I include a measure of children's *school absences*. For kindergarten through grade 5, the ECLS-k reported total number of absences each year taken from school records; however, in the eighth-grade wave this variable was not provided. Instead, teachers were asked to report how often the focal student was absent from class, with responses ranging from "never" to "all of the time". Responses were recoded into a dummy variable with 1 = child absent from class "some of the time" or more, and 0 = child absent from class "rarely" or "never". Based on this division, 25 percent of students were classified as missing class some of the time or more. From this information, the counts of student absences from the earlier waves were dichotomized to identify children in the top 25th percentile of student absences. The measure is thus coded to estimate the association between "more absences" and children's academic achievement.

Concurrent versus Cumulative Measures

The parenting practices and classroom quality variables were calculated in two ways: concurrently and cumulatively. The concurrent variables reflect typical time-varying covariates in longitudinal analysis, whereby wave-specific values are used (Singer and Willett 2003). In this regards, the concurrent measures emphasize changes to children's family and schooling circumstances separately across time (i.e., without

consideration of prior experiences). The concurrent measures will account for the negative association between diagnosis and achievement, as well as the differential association across social class, if specific point-in-time changes to parenting and schooling experiences are most meaningful.

Alternatively, the cumulative parenting and schooling variables aim to capture children's accumulated exposure to experiences over time. To calculate these measures, the value of each variable is incrementally summed across waves. That is, for a variable, such as parental educational expectations, its value for any given wave is equal to the sum of the variable's values for the current and all preceding waves (e.g., grade 5 value = grade 5 + grade 3 + grade 1 + kindergarten parental educational expectations). Similarly for the cumulative schooling measures, each variable is the sum of the current and all preceding waves' values (e.g., grade 3 class ability = grade 3 + grade 1 + kindergarten class ability). If the cumulative measures account for the negative association between diagnosis and achievement, or the variability in association across social class, it would support the idea that diagnoses matter because of the changes to accumulated family and schooling circumstances over time (i.e., consideration of current changes situated upon earlier experiences).

Control Variables

In order to estimate the association between "mental health diagnoses" and children's academic achievement, the mental health *symptoms* that typically precede and accompany diagnosis must be included in the analysis. Here, children's mental health symptoms were measured as time-varying indicators of *internalizing well-being, externalizing well-being*, and *attentiveness*. Internalizing and externalizing well-being

are based on scales provided by the ECLS-k taken from parent, teacher, and child reports of children's well-being, and were originally coded to measure children's internalizing problems (e.g., child is sad, lonely) and externalizing problems (e.g., child is impulsive, quick tempered).[3] Thus, to compute the measure used in the analysis, I reverse coded the variables such that a higher score indicated better mental health. Next, I averaged together the responses from the different informants at each wave. During each wave, two individuals reported information on children's internalizing and externalizing problems; however, the identity of the two informants changed over time. Specifically, in kindergarten and grade 1 the measures of internalizing and externalizing well-being are the average scores taken from parent and teacher responses, in grade 3 and 5 the measures are derived from teacher and child responses, and in grade 8 the measures are based on parent and child responses. Although this could pose a problem for comparability, an examination of the bivariate correlations across waves revealed moderately strong and positive associations (results not shown), which suggests that the measures are reasonably comparable. Additionally, prior research has used a similar strategy to construct measures of children's psychological well-being from multiple informants, therefore there is some precedence for their use (Potter 2010). The third measure of mental health symptoms, attentiveness, is based on teacher reports of children's approaches to learning (e.g., motivation, classroom cooperation, etc.). Attentiveness (or lack thereof) is a key indicator of ADD/ADHD, and has also been

[3] The ECLS-k user's manual describes the index construction process, and reports that each index had relatively high internal validity ($\alpha > 0.70$) (for discussion of index construction, see Tourangeau et al., 2006, Chapter 3, pp. 38-42).

linked to children's educational outcomes (Duncan et al. 2007), therefore this aspect of mental health may be particularly salient given the role of ADD/ADHD in this analysis.

Control variables were also included for children's sociodemographic characteristics. Children's *gender* (1 = female), *race/ethnicity* (1 = African American, 1 = Hispanic, 1 = Asian, 0 = white), *urbanicity* in kindergarten (1 = city, 1 = suburban, 0 = rural), and *region* in kindergarten (1 = Northeast, 1 = Midwest, 1 = West, 0 = South) were included as dummy variables based upon composite measures provided in the ECLS-k. Additionally, children's *age at kindergarten* was included as a time-invariant measure to differentiate between the biological ages of children at the time of their first assessment. Other control variables include children's family structure, financial resources, and academic, residential, and health factors.

Two indicators of family structure were used: presence of two biological parents and number of siblings in the household. *Two biological parents* was a time-varying measure based on parent reports of their current "partner" situation. If both biological parents were reported to be living in the household, then the child received a value of 1; any other configuration received a value of 0. Since the measure only considered the presence of two-biological parents, it does not distinguish between households in which parents were married and households in which parents were cohabiting. *Number of siblings* was also included as a time-varying covariate to further control for the way in which changes to the family structure may alter children's academic achievement.

Financial resources were measured using family income, neighborhood quality, and number of books in the household. The ECLS-k's categorical measure of *income* was converted into dollars by taking the middle value of each category. For example, if

an individual reported their income as a category 9, "between $40,000 and $50,000", I substituted in the middle value of $45,000. This process of substitution was repeated for each wave of the study, except for the Kindergarten wave where family income was already reported as an interval measure. The continuous measure of income was adjusted for inflation and divided by 1000 to increase the relative size of the coefficient. *Neighborhood quality* is a composite measure based upon reports related to the community in which the school was located. School administrators were asked to report on the degree of gang presence, littering, vacant buildings, and drug use in the community around the school on a scale of 1 = big problem to 3 = no problem. Answers on these four items were averaged together to create an overall measure of neighborhood quality ($\alpha \sim 0.72$). Additionally, I included number of *books in the household* as a measure of educational material in the home. This measure is based on parent report of how many children's books the family owned and/or had borrowed from a library.

Grade retention was computed by tracking children's school progress across waves. For each wave a child was at the expected grade level or beyond (e.g., during the fifth round of data collection children were typically in the third grade, so "at grade level or beyond" means that children were either in the third grade or some more advanced grade) they received a 0, and if a child was behind a grade they received a value of 1. Children were only scored a 1 for the first wave in which they reported being below grade level, and subsequent waves were coded as 0, assuming the child made normal progress. *Residential mobility* is a time-varying measure based upon parent reports of the number of places children have lived. If children lived in more than one location since the date of the last interview, they received a value of 1, and otherwise received a value

of 0. For the kindergarten wave, if a child had lived in more than one place prior to attending school they received a value of 1. Finally, *health* is based upon a parent report of children's overall health, and could take on a value of 0 = poor to 5 = excellent.

Time

ECLS-k assessments were given over a several month period during each wave. As a result, children experienced differing amounts of schooling depending on when the assessment was given. To adjust for this design feature, child-specific time measures were computed by setting the grand mean test date of the Spring Kindergarten assessment to 0 and subtracting all waves from that time point. The time variable thus captures variability in the initial assessment date, as well as differences in the number of days between assessment occasions. Time was initially computed in days and to increase the size of the coefficient converted to years.

Missing Values

Missing values were multiply imputed using the ICE command in Stata (Royston 2007). Five data sets were imputed using all the variables contained in the model to estimate missing values. During the imputation process, to ensure that certain variables took only positive values (e.g., age), non-negative interval measures were transformed by taking their natural log prior to imputing, and then exponentiated to original scale for analysis.

Analytic Strategy

For this analysis, I used multi-level mixed effect growth curve modeling (Singer and Willett 2003). Mixed effect modeling offers flexibility in the specification of the time variable, which is necessary given the data collection patterns of the ECLS-k, and is

able to handle both time-varying and time-invariant covariates. I employed a two-level model (e.g., time nested within child), which was appropriately weighted using design-effect adjusted weights provided by ECLS-k programmers to account for the clustering of students in schools during the initial data-collection wave. All regression analyses were performed using HLM software, and descriptive statistics were computed using SPSS.

The first step of the analysis involved estimating the association between mental health diagnoses (i.e., ADD/ADHD and ED) and children's math and reading test scores. The model is described below:

Level 1:

$$Y_{ti} = \pi_{0i} + \pi_{1i}\,(ADHD_{ti}) + \pi_{2i}\,(ED_{ti}) + \pi_{3i}\,(MHS_{ti}) + \pi_{4i}\,(TIME_{ti}) + \pi_{5i}\,(TIME_{ti})^2 + \pi_{6i}\,(X_{ti}) + e_{ti}$$

Level 2:

$$\pi_{0i} = \beta_{00} + \beta_{01}\,ParED_i + \beta_{02}\,X_i + r_{0i}$$

$$\pi_{4i} = \beta_{40} + r_{4i}$$

where Y is either children's reading or math IRT scores, ADHD and ED are the time-varying measures for children's mental health diagnosis status, and MHS is a vector of children's mental health symptoms (e.g., internalizing well-being, externalizing well-being, and attentiveness). TIME and $TIME^2$ are the growth parameters, with the squared term capturing the non-linear change in children's math and reading scores from kindergarten through grade 8. X is the vector of additional level-1 control variables. At level-2, π_{0i}, estimates the intercept and includes all of the time-invariant covariates. Specifically, ParED is the vector of dummy variables for parents' educational attainment (i.e., social class) and X is the vector containing all other measures. Finally, π_{4i},

estimates the linear effect of time. I do not include any covariates in this equation; however, I do set the measure to have a random effect so as to incorporate the individual variability in the linear growth rate across children. This model corresponds to the results reported in Table 5, Model 1. Next, parenting practices and classroom quality measures were added to the model to see if controlling for those factors reduced the size of the coefficient for mental health diagnoses. The concurrent measures were entered first, then the cumulative.

To better understand the role of family and schooling factors in accounting for the association between diagnosis and achievement, I first examined the relationship between ADD/ADHD, ED, and parenting practices and classroom quality. Specifically, I used HLM growth curve models to predict the concurrent and cumulative parenting practices and classroom quality measures. I do not report the coefficients from these analyses, but do provide a table documenting the direction of the association and whether it was statistically significant.

After examining the role of parenting and schooling factors in explaining the "main effect" association between diagnosis and achievement, I consider the differential association between diagnosis and achievement across children's parents' level of education (i.e., social class). For this part of the analysis, I begin by estimating the social class-specific association between diagnosis and children's math and reading scores, using the following model:

Level 1:

$$Y_{ti} = \pi_{0i} + \pi_{1i} (ADHD_{ti\ ti}) + \pi_{2i} (ED_{ti}) + \pi_{3i} (MHS_{ti}) + \pi_{4i} (TIME_{ti}) + \pi_{5i} (TIME_{ti})^2 + \pi_{6i} (X_{ti}) + e_{ti}$$

Level 2:

$$\pi_{0i} = \beta_{00} + \beta_{01}\ \text{ParED}_i + \beta_{02}\ X_i + r_{0i}$$

$$\pi_{1i} = \beta_{10} + \beta_{11}\ \text{ParED}_i$$

$$\pi_{2i} = \beta_{20} + \beta_{21}\ \text{ParED}_i$$

$$\pi_{4i} = \beta_{40} + r_{4i}$$

where each variable has the same definition as given above, except there are four level-2 equations. Two of these equations, π_{0i} and π_{4i}, were present in the first model estimating children's academic achievement, and have not changed. The two new equations, π_{1i} and π_{2i}, test for interaction between social class and children's mental health diagnoses (π_{1i} corresponds to ADD/ADHD and π_{2i} corresponds to ED). In other words, including ParED in the second and third equations at level-2 evaluates whether the association between diagnosis and academic achievement differs for children across this proxy measure for social classes.

Similar to the main effects models, parenting and schooling measures are then included to try and account for the differential, negative association between diagnosis and achievement. To better understand the role of parenting and schooling factors in the model, I again estimated the association that mental health diagnoses have with parenting practices and classroom quality using HLM models. However, I included the interaction between diagnosis and social class to determine if ADD/ADHD and ED children experienced different changes to parenting practices and classroom quality depending on parents' level of education.

Lastly, since the measures of cumulative parenting and cumulative schooling are different from typical time-varying covariates (see, Singer and Willett 2003), it is worth

briefly describing the methodological implications of this approach. HLM growth curve analyses estimate the association between change in time varying variables and change in the dependent variable. Such models thus treat children's exposures to parenting and schooling as if they were independent and unrelated experiences across time. This is in contrast to how most scholars conceive of childhood experiences, since most theoretical and conceptual accounts recognize and emphasize the cumulative processes that contribute to development and the importance of situating current events within earlier ones. Family processes and schooling experiences (and arguably, life in general) are interconnected processes that accumulate over time, and those accrued experiences are what largely contribute to individual development. To more concretely describe the construction of the variables according to a cumulative framework, and make explicit how they differ from typical, concurrent measures, I present hypothetical data for "Child A" in the ECLS-k.

Child A has math test scores for each wave of the study (math scores: 15, 35, 54, 67, and 82), five corresponding time values associated with those tests (time in years: 0, 1, 3, 5, and 8), five measures of parental educational expectations (expectations: 1, 0, 1, 0, and 1), and five measures for classroom ability (ability: 1, 1, 1, 1, and 1). Based on these values, there is a positive trend in the child's math scores (i.e., the scores increase) and a positive trend in the child's time measures (i.e., time counts up). However, there is a non-monotonic trend in the expectation scores, as the value drops from the first to second wave, then increases between the second and third wave, and so forth. Additionally, the classroom ability variable does not change across waves (i.e., always equal to 1). If all three time-varying covariates were included in a growth curve analysis,

the time variable would likely be the strongest predictor of the math scores, because it changes (i.e., grows) in unison with achievement. The measures of parental educational expectations and classroom ability would likely be much less clearly associated with achievement since the modeling procedure emphasizes change, and the parental educational expectation measure does not change in a consistent manner relative to children's growth, and the value for Child A's classroom ability variable does not change at all. Yet, if we take Child A and use a cumulative framework, the expectations variable would take on a monotonic structure across the five analytic waves (cumulative expectations: 1, 1, 2, 2, and 3), as would classroom ability (cumulative ability: 1, 2, 3, 4, and 5). These measures would thus "grow" along with children's math scores, as children accumulate these family and schooling experiences over time. As a result, both variables will likely demonstrate a stronger association with children's math score than their concurrent counterparts. Moreover, since these measures incorporate past experiences into "current" measures, it conceptually aligns with most contemporary explanation for how and why parenting and classroom quality matter.

To graphically show the two types of parenting and schooling measures, I have created figures depicting the concurrent and cumulative measures for parental educational expectations and classroom ability levels. Figure 1.1 shows the proportion of parents who expect their children to obtain a bachelor's degree or more and Figure 2.1 shows the proportion of children enrolled in a "lower ability" classroom *concurrently* for each wave of the study. Figures 1.2 and 2.2 also depict the values for parental educational expectations and classroom ability, respectively, but use the *cumulative* measures. The figures displaying the cumulative measures reveals a much more distinct pattern of

inequality in children's parenting and schooling experiences, with very apparent gaps associated with diagnosis status.

[insert Figure 1.1 and Figure 1.2 about here]

[insert Figure 2.1 and Figure 2.2 about here]

RESULTS

[insert Table 1 about here]

Table 1 reports the mean and standard deviation for the time-invariant measures separately by diagnosis status (i.e., non-diagnosed, ADD/ADHD, and ED). According to these descriptive statistics diagnosed children are disproportionately white and male. Table 2 presents the mean and standard deviation for the kindergarten-wave values of the time-varying covariates. Tables with values for all waves are available from the author upon request.

[Insert Table 2 about here]

Table 3 provides a summary of results from the HLM models estimating the relationship between mental health diagnosis and children's exposure to *concurrent* parenting and schooling experiences. In the table, an upward arrow indicates a positive association, a downward arrow indicates a negative association, and "NS" is listed for non-significant associations. Results suggest that ADD/ADHD and ED diagnoses are related to changes to parenting and classroom quality, but not every association is statistically significant. For example, children diagnosed with ADD/ADHD tend to experience a decline in their participation with child activities (i.e., sports teams, organized clubs); however, ADD/ADHD does not appear to be associated with parent-child activities (i.e., parents play games, build things, and work on hobbies with their

children). Comparatively, children diagnosed with ED often experience declines in their parent-child activities, but appear to remain consistently involved in child activities (i.e., there is no significant change following diagnosis). Still, the overall results suggest a pattern whereby children with mental health diagnoses experience declines in their exposure to quality parenting practices and classrooms. Since these estimates rely on the concurrent measures, the reported associations emphasize changes in family and schooling factors that occur separately year-after-year without consideration given to prior experiences.

Table 4 reports the results from the HLM models estimating the association between mental health diagnoses and children's *cumulative* family and schooling experiences. The evidence once again indicates that diagnoses are associated with changes to parenting practices and classroom quality; however, the type of change estimated for the cumulative measures is methodologically and conceptually different from the change estimated in the concurrent measure models. That is, the cumulative measures emphasize children's exposure to long-term parenting and classroom conditions; therefore, changes associated with being diagnosed imply that diagnoses disrupt the social context that children might expect predicated upon prior experiences.

The results from Tables 3 and 4 suggest that there are two potential processes connecting family and schooling with the poorer educational outcomes of diagnosed children. First, if declines in children's achievement associated with ADD/ADHD and ED diagnoses are due to reductions in the quality of parenting and classroom experiences without consideration given to changes accumulated over time, then controlling for the concurrent measures should account for a large portion of the achievement gap.

Alternatively, if diagnosed children's academic achievement is lower because of accumulated changes to their long-term exposure to family and schooling factors following diagnosis, then including the cumulative measures in the model should explain most of the negative association.

[insert Table 3 about here]

[insert Table 4 about here]

Family, Schooling, and the Association between Diagnosis and Achievement

Math Scores. Table 5 reports the results for the models estimating the association between diagnosis and children's math scores. The table includes the coefficients for the "main effect" of ADD/ADHD, ED, and parents' educational attainment, which provides information on the independent association of diagnosis and social status as they relate to children's attainment (the second part of the analysis will examine the intersection of social status and diagnosis). In the baseline model, ADD/ADHD is negatively associated with math scores, and ED is unrelated and trending positive (Model 1). Additionally, children's academic performance is higher as parents' level of education increases.

To test whether parenting and schooling factors help account for the decline in math performance associated with mental health diagnoses, Model 2 included the concurrent measures and the negative ADD/ADHD coefficient was reduced by 9 percent. Controlling for concurrent parenting and schooling factors also reduced the size of the gaps associated with parents' education by at least 26 percent (depending on the comparison). Thus, in line with prior research (Cheadle 2008; Condron 2009; Tach and Farkas 2006), parenting practices and classroom quality help account for a moderate portion of the academic advantage associated with having more educated parents, but

these factors were not able to explain much of the decline in achievement associated with diagnosis. To assess whether the cumulative measures better explain the gap in achievement associated with diagnosis, the concurrent measures are removed and the cumulative ones introduced in Model 3.

Including the cumulative family and schooling measures reduced the negative association between ADD/ADHD and math scores by 50 percent, and the positive association between ED and math nearly doubled. Indeed, the ED coefficient became statistically significant, indicating that being diagnosed would be expected to improve children's math achievement if diagnosed children received the same quality long-term parenting and classroom experiences as non-diagnosed children. Large reductions in the social class coefficients were also observed (see Table 5, Model 3). Children's accumulated parenting practices and classroom quality experiences accounted for the negative "main effect" association between diagnosis and math achievement.

[insert Table 5 about here]

Reading Scores. Additional evidence of the importance of cumulative parenting and classroom factors comes from the models estimating children's reading scores. Table 6 reports the findings for reading achievement, and in the baseline model ADD/ADHD is negatively associated with children's test scores, and ED is trending negative but not significant. Additionally, gaps were observed between parents' education levels, with the largest gap between children whose parents were most and least educated. Model 2 included the concurrent parenting and classroom measures, and the negative ADD/ADHD coefficient was reduced by 21 percent, and the social class gaps were reduced by at least 35 percent (although all differences remained statistically

significant). The concurrent measures were thus able to account for more of the gap between diagnosed and non-diagnosed children in the reading model than in the math model (20.6 v. 9.2 percent), but the reading scores of ADD/ADHD children were still expected to decline by more than 3 points (see Model 2).

The cumulative parenting and classroom quality measures were entered in Model 3, and compared to Model 1, the ADD/ADHD coefficient was reduced by nearly 75 percent to marginal significance ($p < .10$). Additionally, the ED coefficient, which had trended negative in Model 1 and Model 2, reversed sign and was trending positive (but not statistically significant). The gaps in achievement associated with parents' level of education were also reduced with the inclusion of the cumulative measures by at least 47 percent (although the gaps remained statistically significant). Taken together, Tables 5 and 6 provide evidence that cumulative family and schooling experiences account for more of the decline in children's academic achievement associated with mental health diagnoses than is explained by the concurrent measures. However, these models are focused on the main effect associated with diagnosis, and how parenting and schooling account for the independent relationship that ADD/ADHD, ED, and parents' educational attainment have with math and reading test scores. What remains unclear is how parenting and schooling matter for children's achievement at the intersection of social class and mental health.

[inset Table 6 about here]

Parenting, Schooling, and the Intersection of Diagnosis and Social Class

Earlier evidence showed that parenting and schooling differed according to parents' educational attainment and diagnosis status, separately (see Table 2.1 and Tables

3 and 4), but these statuses need to be considered together. If parenting practices and classroom quality were to account for the differential association between diagnosis and achievement, then these circumstances would need to be differently associated with diagnosis depending on social background. To investigate whether the family and schooling experiences of diagnosed and non-diagnosed children vary according to parents' educational attainment, I again used HLM models to predict children's exposure to parenting practices and classroom quality factors including interaction terms between parents' education and diagnosis status. Table 7.1 reports the results for *concurrent* parenting practices, Table 7.2 reports the results for *concurrent* schooling factors, and Tables 8.1 and 8.2 report the results for *cumulative* parenting and schooling, respectively. Similar to before, I report the direction and statistical significance of the coefficient; but importantly, because these results are based on interaction terms, the reference group (i.e., high school or less) provides the main effect and all other coefficients (and their associated arrows) are relative to the reference group.

[insert Table 7.1 about here]

[insert Table 7.2 about here]

Tables 7.1 and 7.2 show a pattern in which diagnoses do not appear to be differentially associated with changes to parenting practices or classroom quality following a diagnosis, with most of the associations being non-significant. Additionally, "trends" in the interaction term coefficients only partially support the claim that children with less educated parents experience a greater decline in beneficial parenting or classroom circumstances. For example, ADD/ADHD and ED diagnosis was associated with a decline in the number of parent-child activities most notably for children whose

parents had a high school diploma or less (i.e., least educated), and children with more educated parents experienced less of a decline to their parent-child activities following a diagnosis (indicated in the table by the downward arrow for ADD/ADHD and ED children's whose parents had a high school diploma or less, and the upward arrows for all other diagnosed children). In contrast, ED children whose parents had a high school diploma or less were expected to experience an increase in their number of child activities, whereas other children were expected to experience relatively less improvement (denoted by the upward arrow for ED children whose parents earned a high school diploma or less, and the downward arrows for all other groups). Similar patterns were observed for the school measures in Table 7.2, for example, children diagnosed with ADD/ADHD or ED whose parents had a high school diploma or less were more likely to be rated as a high-ability reader following diagnosis, whereas other children were relatively less likely to be rated as such. The results suggest that changes in concurrent parenting and classroom quality following diagnosis are largely the same for all children regardless of parents' education level. Consequently, the concurrent family and schooling factors are unlikely to explain the differential association between diagnosis and achievement.

The results from the models estimating the differential association between diagnosis and children's cumulative parenting practices and classroom quality, however, show a very different pattern. Table 8.1 reports findings indicating that diagnosis is associated with a decline in cumulative parenting most often for children whose parents were least educated. For example, an ED diagnosis was associated with lower parental school involvement for children whose parents had a high school diploma or less, but

other levels of education were associated with a relatively smaller decline in involvement (i.e., an upward arrow). Similarly for child activities, children diagnosed with ADD/ADHD or ED whose parents were least educated experienced the largest drop in their activity participation. This pattern was also observed for educational expectations and parent-to-parent communication, and partially present for parent-child activities.

Similar to the patterns for cumulative parenting, the results reported in Table 8.2 suggest that children's exposure to cumulative classroom quality varied according to parents' education level. For example, ADD/ADHD and ED children were more likely to be placed in a lower ability classroom if their parents were least educated. Likewise, ADD/ADHD and ED children with the least educated parents experienced the largest increase in teachers' ratings of low math and reading skills, while children from more advantaged families had relatively fewer occurrences of low-skill ratings.

[insert Table 8.1 about here]

[insert Table 8.2 about here]

Based on the patterns in Tables 8.1 and 8.2, becoming diagnosed is associated with changes to accumulated parenting practices and classroom quality; however, the type and degree of change appears to largely depend on children's social background. Specifically, declines to cumulative family and schooling circumstances associated with mental health diagnoses are primarily limited to children with less educated parents. Diagnosed children with more educated parents alternatively experience little or no decline in their exposure to quality parenting or classroom contexts. That is, the decline in family or schooling experiences for children with less educated parents is off set by the positive interaction terms for children with more educated parents. Children with less

educated parents thus appear to be the ones experiencing the most decline to parenting and classroom quality when diagnosed with a mental health problem, and this may account for the differential association between diagnosis and achievement across levels of parents' education.

Cumulative Parenting, Schooling and Academic Achievement

Table 9 presents models estimating the differential association between diagnosis and children's math scores across levels of parents' educational attainment. ADD/ADHD and ED are associated with declines in math scores that are largest for children with the least educated parents. Specifically, the math scores of children whose parents attained a high school diploma or less declined by nearly 5 points following an ADD/ADHD diagnosis, and ED diagnosis was associated with a 3.7 point drop in math for this group as well (see Model 1). Children with more educated parents tended to experience less negative consequences following a diagnosis: children with ADD/ADHD whose parents had some education beyond a bachelor's degree were essentially unaffected by the diagnosis (-4.87 + 5.09 = 0.22), and children with ED whose parents had a bachelor's degree actually experienced a moderate increase in math score (-3.67 + 6.77 = 3.10). To determine if family and schooling factors might account for this differential association the concurrent measures were introduced in Model 2. As might be expected given the results from Tables 7.1 and 7.2, minimal changes were observed in the coefficients between Model 1 and Model 2. Of note, several concurrent measures were independently associated with achievement (coefficients not shown); nevertheless, these factors did not reduce the moderating effect of parents' education. Thus, concurrent changes in parenting practices and classroom quality that fail to consider accumulated exposure do

not account for the more negative consequences associated with diagnosis for children with less educated parents.

The concurrent measures were removed and the cumulative parenting practices and classroom quality variables included for Model 3, which resulted in several important changes to the coefficients. First, the interaction coefficients between parents' educational attainment and ADD/ADHD diagnosis were no longer statistically significant. All children experienced statistically similar consequences from being diagnosed. Second, the size of the interaction coefficients between ED diagnosis and parents' education were greatly reduced; although, two of the interactions remained significant (i.e., interactions with "some college" and "Bachelor's degree"). Finally, the coefficients for the reference groups (i.e., children diagnosed with either ADD/ADHD or ED whose parents had a high school diploma or less) were reduced. Specifically, in Model 1, the coefficients for the reference group of children with ADD/ADHD or ED were –4.87 and –3.67, respectively, but in Model 3 the coefficients were –2.58 and –0.44 for ADD/ADHD and ED. The ED coefficient was no longer statistically significant, and the ADD/ADHD coefficient was reduced by 47 percent (though it remained significant, $p < .01$). Since the coefficient for the ED reference group was no longer statistically different from 0, the positive interaction terms for children with more educated parents suggests that at worst, all children were unaffected when diagnosed (net of cumulative parenting and schooling factors), and that for some children, ED diagnosis was associated with an increase in math scores. These findings indicate that cumulative parenting and schooling factors account for the differential association between ADD/ADHD and ED diagnosis with children's math scores across levels of parents' educational attainment.

[insert Table 9 about here]

Table 10 presents the models estimating children's reading scores. Similar to the math models, the negative association between diagnosis and reading was largest for children whose parents had the least amount of education. ADD/ADHD diagnosis was associated with a 4.4 point decline in reading scores for children whose parents had a high school diploma or less, while children whose parents had a bachelor's degree experienced only a one-point decline (Model 1). Likewise, the reading scores for children whose parents had a high school diploma or less declined by more than 5 points following an ED diagnosis, compared to children with more educated parents whose test scores actually improved by more than 3 points. Model 2 included the concurrent measures, and there was some evidence that concurrent parenting and schooling accounted for the differential association between ADD/ADHD and achievement across levels of parents' education. Specifically, the ADD/ADHD coefficient for children whose parents had a high school diploma or less was reduced by twenty percent and the interaction terms were no longer marginally significant. However, the coefficients for the ED diagnosis actually increased (minimally) from Model 1 to Model 2. Concurrent changes to parenting practices and classroom quality thus partially account for the differential negative associations between ADD/ADHD and children's reading scores, but do not explain differences in performance for ED children.

[insert Table 10 about here]

The concurrent measures are removed for Model 3, and the cumulative measures are included. Unlike Model 2, which had mixed evidence that parenting and schooling factors partially accounted for the differential association between diagnosis and

achievement, there was very clear evidence that the cumulative measures mattered. In particular, none of the interaction terms between parents' educational attainment and diagnosis status were significant for either ADD/ADHD or ED diagnoses. Furthermore, the coefficients for the reference groups (i.e., diagnosed children whose parents have a high school diploma or less) were reduced by 83 and 89 percent, for ADD/ADHD and ED, respectively, both to statistical non-significance. Thus, net of cumulative parenting practices and classroom quality, the association between diagnosis and reading achievement was the same regardless of parents' educational attainment, and these cumulative factors explained the overall association between diagnosis and reading.

The results from Tables 9 and 10 provide consistent evidence that diagnoses are differently associated with achievement depending on children's social background—with specific consideration here given to parents' educational attainment. Moreover, presented results indicate that children's exposure to cumulative parenting practices and classroom quality largely account for the observed differences in the association, suggesting that accumulated experiences during childhood provide the basis whereupon the consequences of diagnosis are built. The evidence additionally indicates that considering family and schooling factors through a cumulative lens is an improvement over the typical concurrent framework. In combination with the results from Tables 8.1 and 8.2, these findings suggest that diagnoses have different consequences for children's achievement because children with less educated parents experience declines in their long-term family and schooling circumstances. In contrast, the family and schooling experiences of children with more educated parents tend to change very little following diagnosis, and remain of relatively higher quality. Explanation for the differential effects

of diagnosis therefore involves class-specific experiences of changes to children's family and schooling social context.

[insert Table 10 about here]

DISCUSSION

There is extensive evidence that mental health diagnoses are negatively associated with children's academic achievement; that is, children diagnosed with ADD/ADHD or ED tend to perform below their peers on assessments of reading and math skills (Blackorby et al. 2005; Eisenberg and Schneider 2007). Current explanations of this lower performance that focus on contextual factors have identified parenting practices and classroom quality as contributing to the poorer academic outcomes of diagnosed children (Wehby, Lane and Falk 2003). That is, mental health diagnoses tend to detract from beneficial family and schooling experiences, which diminishes children's learning and academic gains. Although useful for understanding how diagnoses influence the conditions and circumstances surrounding children, explanations typically focused on family and schooling factors have dedicated the bulk of their attention to changes that ignore accumulated effects over time. Accordingly, parenting and schooling experiences matter because of single point-in-time changes associated with children being diagnosed. However, these snap-shots of children's family and schooling contexts downplay important cumulative processes whereby changes in a particular year are not considered in relation to changes that may have occurred in previous years and that may continue to occur later on.

Drawing on the cumulative framework from the life-course perspective, I examined measures of children's family and schooling that emphasized the accumulation

of experiences over time and their association with the lower academic performance of ADD/ADHD and ED children. Mental health diagnoses were associated with declines to the quality of parenting and classroom conditions over many years, and the cumulative measures captured this aspect in the long-term social contexts of diagnosed children. Moreover, the cumulative measures were able to account for more of the math and reading test score gaps between diagnosed and non-diagnosed children than the concurrent measures, confirming the importance of considering accumulated experiences for understanding children's outcomes.

In addition to examining the "main effect", I also investigated the role of family and schooling in the differential association between diagnosis and achievement across levels of parents' educational attainment. The findings indicate that middle class children experience fewer declines in their academic achievement associated with a mental health diagnosis, and this difference is accounted for by cumulative family and schooling factors. Diagnosed children with more educated parents were exposed to relatively higher levels of active and cultivating parenting and continued to be placed in higher ability classrooms year-after-year. Comparatively, diagnosed children with less educated parents often experienced declines to their already lower-quality family and schooling circumstances when diagnosed. The social status associated with lower parents' educational attainment and the repercussions of mental health status associated with diagnosis are thus doubly experienced through long-term declines to family and schooling quality, resulting in the differential association that ADD/ADHD and ED have with academic achievement. These results lend themselves to an explanation focused on children's context, and the importance of social forces in determining consequence.

Diagnosis matters differently because the social context related to levels of parents' educational attainment exposes children to practices and classroom quality that uniquely shape the environment in which ADD/ADHD and ED is experienced.

Reported findings indicate that applying a cumulative framework to the study of parenting and schooling experiences better explains the negative association between mental health diagnoses and academic achievement. In one respect, this suggests that research needs to take a broader view of the factors that inform the "consequences of diagnosis", and recognize how cotemporaneous family and schooling practices need to be considered in the temporal and social context of prior events. At the same time, the success of the cumulative perspective for understanding diagnosed children's lower performance could be interpreted pessimistically to imply that once a child is diagnosed, their lower academic performance is inevitable given the relevance of long-term family and school influences. While this explanation may fit the results, a more optimistic interpretation is that given the importance of accumulated parenting and schooling experiences, interventions for improving the academic performance of diagnosed children need to be particularly aware in addressing deficits associated with prior, current, and ongoing family and schooling conditions. Thus, rather than view these results as an end-game scenario for diagnosed children, they serve as a reminder that effective programs and services must look beyond merely the present (especially for children from less advantaged social backgrounds).

However, the contributions and insights of this study are not without their own limitations, as there is a continued need for further research. In particular, future studies with access to doctor reports and medical records may offer much needed validation of

the presence and timing of mental health diagnoses and their relationship with children's academic achievement. Furthermore, although cumulative parenting and schooling experiences appear to account for most of the lower academic performance of diagnosed children, the mechanisms responsible for this linkage are undefined. "Child activities", "parental school involvement", "classroom ability level", and "teacher attitude" broadly describe certain family and schooling conditions that contribute to children's academic achievement, but for more specific description of the processes at work, future research is needed. Experimental data and qualitative investigations may prove particularly insightful.

Presented results challenge previous findings regarding the explanations for the negative association between mental health diagnosis (i.e., ADHD and ED) and children's academic achievement. While prior research had identified family and schooling experiences as important factors contributing to the poorer performance of diagnosed children, I extended that argument by applying a cumulative framework. I found that cumulative exposure to parenting practices and classroom quality largely accounted for the decline in children's education related to being diagnosed. These findings suggest that long-term, accumulated experiences are important to consider in analyses of the consequences of mental health. I then further examined the role of parenting and schooling factors in explaining the differential association of diagnosis across parents' level of education. Again, parenting and schooling factors accounted for the negative relationship between diagnosis and achievement, and were additionally able to eliminate differences in the consequences across levels of parents' educational attainment (i.e., social class). Parenting practices and classroom quality thus inform

children's social context, thereby contributing to early formative experiences that shape the consequences of mental health diagnosis, and its intersection with social inequality.

Table 1. Descriptive Statistics for Time-Invariant Variables by Diagnosis Status

	ADD/ADHD (n = 1,120)		ED (n = 830)		Undiagnosed (n = 14,700)		Overall (n = 16,370)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Parents' Educational Attainment								
High school or less	0.28	0.45	0.24	0.43	0.30	0.46	0.30	0.46
Some college	0.39	0.49	0.37	0.48	0.36	0.48	0.36	0.48
Bachelor's degree	0.20	0.40	0.22	0.42	0.21	0.41	0.21	0.41
Graduate work	0.13	0.33	0.16	0.37	0.13	0.34	0.13	0.34
Female	0.26	0.44	0.39	0.49	0.50	0.50	0.48	0.50
Race/ethnicity								
White	0.72	0.45	0.70	0.46	0.56	0.50	0.58	0.49
African American	0.12	0.32	0.09	0.28	0.16	0.37	0.16	0.36
Hispanic	0.11	0.31	0.17	0.37	0.19	0.40	0.19	0.39
Asian	0.00	0.06	0.00	0.06	0.03	0.18	0.03	0.17
Other	0.05	0.22	0.04	0.21	0.05	0.21	0.05	0.21
Urbanicity								
City	0.33	0.47	0.32	0.47	0.37	0.48	0.37	0.48
Suburb	0.41	0.49	0.45	0.50	0.41	0.49	0.41	0.49
Rural	0.26	0.44	0.24	0.42	0.21	0.41	0.22	0.41
Region								
Northeast	0.17	0.38	0.22	0.41	0.18	0.38	0.18	0.38
Midwest	0.27	0.44	0.28	0.45	0.23	0.42	0.24	0.43
South	0.44	0.50	0.31	0.46	0.37	0.48	0.38	0.48
West	0.12	0.33	0.19	0.39	0.22	0.41	0.21	0.41
Age (in months)	74.91	4.93	75.06	4.48	74.74	4.40	74.76	4.44

NOTE: The numbers of each category will sum to more than the size of the overall sample, because some children were diagnosed with both ADD/ADHD and ED.

Table 2. Descriptive Statistics for the Kindergarten Value of the Time-Varying Measures by Diagnosis Status

	ADD/ADHD (n = 1,120)		ED (n = 830)		Undiagnosed (n = 14,700)		Overall (n = 16,370)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Parenting Practices								
Parental educational expectations	0.65	0.48	0.70	0.46	0.76	0.43	0.75	0.43
Parent-child activities	2.75	0.48	2.77	0.51	2.77	0.50	2.77	0.50
Parental school involvement	4.33	1.59	4.38	1.64	4.13	1.73	4.15	1.72
Parent-to-parent contact	1.69	2.66	2.13	3.06	2.21	2.97	2.18	2.95
Child activities	0.99	1.02	1.17	1.18	1.02	1.13	1.03	1.13
Classroom Quality								
Classroom ability	0.22	0.42	0.23	0.42	0.23	0.42	0.23	0.42
Classroom behavior	0.15	0.36	0.14	0.35	0.11	0.31	0.11	0.31
Teacher report of child's skills								
Math skills - low	0.38	0.49	0.31	0.46	0.24	0.43	0.26	0.44
Math skills - high	0.14	0.35	0.19	0.39	0.23	0.42	0.23	0.42
Reading skills - low	0.42	0.49	0.33	0.47	0.26	0.44	0.27	0.45
Reading skills - high	0.14	0.34	0.19	0.39	0.25	0.43	0.24	0.43
Teacher attitude - low	0.30	0.46	0.25	0.43	0.28	0.45	0.28	0.45
Teacher attitude - high	0.39	0.49	0.42	0.49	0.41	0.49	0.41	0.49
Absences - high	0.27	0.45	0.30	0.46	0.27	0.44	0.27	0.44
Mental health symptoms								
Internalizing well-being	3.33	0.34	3.30	0.34	3.46	0.30	3.44	0.31
Externalizing well-bein	2.71	0.57	2.94	0.58	3.23	0.46	3.19	0.49
Attentivieness	2.74	0.40	2.91	0.45	3.10	0.42	3.07	0.43
Family structure								
Two-biological parents	0.54	0.50	0.57	0.50	0.66	0.47	0.65	0.48
Siblings	1.37	1.10	1.41	1.05	1.50	1.17	1.49	1.16
Financial resources								
Income ($1000s)	58.76	50.00	63.76	55.92	62.68	54.59	62.55	54.42
Neighborhood quality	2.63	0.42	2.61	0.44	2.60	0.46	2.60	0.45
Books	76.42	58.91	83.59	60.33	70.66	58.99	71.52	59.15
Grade retention	0.09	0.29	0.08	0.27	0.06	0.24	0.06	0.24
Residential mobility	0.69	0.46	0.68	0.47	0.63	0.48	0.63	0.48
Health	4.18	0.89	4.11	0.92	4.30	0.81	4.28	0.82
Parent and Household Traits								
Parental depressiveness	1.57	0.50	1.61	0.52	1.45	0.45	1.47	0.46
Parental warmth	2.92	1.09	2.83	1.18	3.07	1.09	3.05	1.09
High culture activities	1.00	0.90	1.10	0.95	1.06	0.96	1.06	0.96
Family routines	3.69	1.02	3.65	1.09	3.66	1.09	3.66	1.08
Spank	0.83	0.37	0.80	0.40	0.81	0.40	0.81	0.39
Discuss when wrong	0.73	0.44	0.72	0.45	0.74	0.44	0.74	0.44

NOTE : The numbers of each category will sum to more than the size of the overall sample, because some children were diagnosed with both ADD/ADHD and ED.

Table 3. Directional Association between Diagnosis and Children's Exposure to Concurrent Parenting and Schooling

	ADHD		ED	
Parenting Practices	*Direction*	*Sig. (p-value)*	*Direction*	*Sig. (p-value)*
Parental School Involvement	↑	NS	↑	0.000
Parent-to-Parent Contact	↓	0.001	↓	NS
Child Activities	↓	0.029	↓	NS
Parent-Child Activities	↓	NS	↓	0.060
Educational Expectations	↓	0.000	↓	0.000
Schooling Quality				
Classroom Ability (low)	↑	0.000	↑	0.055
Classroom Behavior (low)	↑	NS	↓	NS
Math Skills Rating (low)	↑	0.000	↓	NS
Math Skills Rating (high)	↓	0.000	↓	NS
Reading Skills Rating (low)	↑	0.000	↑	NS
Reading Skills Rating (high)	↓	0.010	↓	NS
Teacher Attitude (low)	↓	NS	↓	NS
Teacher Attitude (high)	↑	NS	↑	0.097
Absences (high)	↑	NS	↑	0.000

NOTE: An upward arrow indicates that diagnosis is associated with a significant increase in the parenting or school quality measure. A downward arrow indicates that diagnosis is associated with a significant decrease in the parenting or school quality measure. NS indicates a non-significant association between diagnosis and the parenting or school quality measure. Significance level at $p < .05$.

Table 4. Directional Association between Diagnosis and Children's Exposure to Cumulative Parenting and Schooling

	ADHD		ED	
Parenting Practices	*Direction*	*Sig. (p-value)*	*Direction*	*Sig. (p-value)*
Parental School Involvement	↑	0.014	↑	0.000
Parent-to-Parent Contact	↓	0.000	↑	NS
Child Activities	↓	0.007	↑	NS
Parent-Child Activities	↓	NS	↓	NS
Educational Expectations	↓	0.000	↓	0.000
Schooling Quality				
Classroom Ability (low)	↑	0.000	↑	0.031
Classroom Behavior (low)	↑	0.000	↑	NS
Math Skills Rating (low)	↑	0.000	↑	0.014
Math Skills Rating (high)	↓	0.000	↓	0.003
Reading Skills Rating (low)	↑	0.000	↑	0.000
Reading Skills Rating (high)	↓	0.000	↓	0.000
Teacher Attitude (low)	↑	0.053	↓	NS
Teacher Attitude (high)	↓	NS	↑	NS
Absences (high)	↑	NS	↑	0.000

NOTE: An upward arrow indicates that diagnosis is associated with a significant increase in the parenting or school quality measure. A downward arrow indicates that diagnosis is associated with a significant decrease in the parenting or school quality measure. NS indicates a non-significant association between diagnosis and the parenting or school quality measure. Significance level at $p < .05$.

Table 5. HLM Growth Curve Analysis Main Effect of Diagnosis Models Predicting Children's Math Scores (selected results)

	Model 1		Model 2		*% Change*	Model 3		*% Change*
	b	SE	b	SE	*2 v. 1*	b	SE	*3 v. 1*
Mental Health Diagnoses								
ADD/ADHD	-2.99 ***	0.47	-2.72 ***	0.45	*-9.3*	-1.48 **	0.43	*-50.4*
ED	0.79	0.60	0.61	0.59	*-22.1*	1.43 *	0.55	*82.7*
Social Class (Parental Educational Attainment)								
Some College	3.04 ***	0.25	2.08 ***	0.23	*-31.7*	1.63 ***	0.23	*-46.4*
Bachelor's degree	6.49 ***	0.33	4.68 ***	0.31	*-27.9*	4.25 ***	0.30	*-34.5*
Graduate work	9.42 ***	0.41	6.96 ***	0.38	*-26.2*	6.21 ***	0.36	*-34.1*
Time	25.83 ***	0.09	25.36 ***	0.10		24.70 ***	0.18	
Time sq	-1.65 ***	0.01	-1.58 ***	0.01		-1.58 ***	0.01	
Intercept	7.14 ***	1.03	15.34 ***	1.15		15.88 ***	1.04	
Control Variables								
Controls	Yes		Yes			Yes		
Concurrent Measures	No		Yes			No		
Cumulative Measures	No		No			Yes		
n (sample size)	~16,760		~16,760			~16,760		

*** p<0.001, **p<0.01, *p<0.05

NOTE: Analyses are weighted and adjusted for sample design effects.

NOTE: In the models the Controls include race/ethnicity, mental health symtpoms, child characteristics (e.g., gender, age, health), family structure/resources (e.g., neighborhood quality, family income, biological parents in household), and family process measures (e.g., discipline, family routines, parental warmth). Concurrent measures include parenting practices (e.g., parental school involvement, child activities, parental educational expectations) and school quality (e.g., classroom ability, classroom behavior, teacher rating of skills) that were reported cotemporaneous with the dependent variable. Cumulative measures in parenting practices and school quality that are based on children's accumulated experiences.

Table 6. HLM Growth Curve Analysis Main Effect of Diagnosis Predicting Children's Reading Scores (selected results)

	Model 1		Model 2		*% Change*	Model 3		*% Change*
	b	SE	b	SE	*2 v. 1*	b	SE	*3 v. 1*
Mental Health Diagnoses								
ADD/ADHD	-3.92 ***	0.59	-3.12 ***	0.55	*-20.6*	-0.99 ~	0.51	*-74.9*
ED	-0.71	0.70	-0.73	0.68	*2.1*	0.68	0.62	*-195.6*
Social Class (Parental Educational Attainment)								
Some College	4.62 ***	0.32	2.88 ***	0.29	*-37.7*	2.01 ***	0.28	*-56.4*
Bachelor's degree	8.57 ***	0.40	5.32 ***	0.37	*-38.0*	4.36 ***	0.36	*-49.2*
Graduate work	12.77 ***	0.51	8.36 ***	0.46	*-34.5*	6.75 ***	0.43	*-47.1*
Time	32.95 ***	0.10	32.29 ***	0.11		30.17 ***	0.20	
Time sq	-2.27 ***	0.01	-2.19 ***	0.02		-2.11 ***	0.02	
Intercept	5.47 ***	1.39	16.62 ***	1.42		19.07 ***	1.29	
Control Variables								
Controls	Yes		Yes			Yes		
Concurrent Measures	No		Yes			No		
Cumulative Measures	No		No			Yes		
n (sample size)	~16,630		~16,630			~16,630		

*** p<0.001, **p<0.01, *p<0.05

NOTE: Analyses are weighted and adjusted for sample design effects.

NOTE: In the models the Controls include race/ethnicity, mental health symtpoms, child characteristics (e.g., gender, age, health), family structure/resources (e.g., neighborhood quality, family income, biological parents in household), and family process measures (e.g., discipline, family routines, parental warmth). Concurrent measures include parenting practices (e.g., parental school involvement, child activities, parental educational expectations) and school quality (e.g., classroom ability, classroom behavior, teacher rating of skills) that were reported cotemporaneous with the dependent variable. Cumulative measures in parenting practices and school quality that are based on children's accumulated experiences.

Table 7.1. Directional Association between Diagnosis and Children's Exposure to Cumulative Parenting by Social Class

	ADHD		ED	
Parenting Practices	*Direction*	*Sig. (p-value)*	*Direction*	*Sig. (p-value)*
Parental School Involvement				
High school or less	↑	NS	↑	0.002
Some college	↑	NS	↓	NS
Bachelor's degree	↓	NS	↓	NS
Graduate work	↑	NS	↓	NS
Parent-to-Parent Contact				
High school or less	↓	0.000	↓	NS
Some college	↑	0.019	↑	NS
Bachelor's degree	↑	NS	↓	NS
Graduate work	↑	NS	↑	NS
Child Activities				
High school or less	↓	NS	↑	NS
Some college	↑	NS	↓	NS
Bachelor's degree	↓	NS	↓	NS
Graduate work	↑	NS	↓	NS
Parent-Child Activities				
High school or less	↓	0.075	↓	NS
Some college	↑	0.021	↑	NS
Bachelor's degree	↑	NS	↑	0.076
Graduate work	↑	NS	↑	NS
Educational Expectations				
High school or less	↓	0.000	↓	NS
Some college	↓	0.059	↓	0.006
Bachelor's degree	↑	NS	↑	NS
Graduate work	↑	0.015	↓	NS

NOTE: "High school or less" servces as the reference group for estimating the association between mental health diagnosis and academic achievement. Thus, the direction of the arrow for that group represents the main effect, and the direction of the arrow for the other groups represent the direction of the association relative to association for children whose parents had a high school diploma or less. P-values are reported if less than 0.100, and NS indicates a non-significant coefficient ($p > 0.10$).

Table 7.2. Directional Association between Diagnosis and Children's Exposure to Cumulative Schooling

	ADHD		ED	
Schooling Quality	*Direction*	*Sig. (p-value)*	*Direction*	*Sig. (p-value)*
Classroom Ability (low)				
High school or less	↑	0.000	↑	NS
Some college	↓	NS	↓	NS
Bachelor's degree	↓	0.026	↑	0.069
Graduate work	↓	0.001	↓	NS
Classroom Behavior (low)				
High school or less	↓	NS	↓	NS
Some college	↑	NS	↑	NS
Bachelor's degree	↑	NS	↓	NS
Graduate work	↑	NS	↑	NS
Math Skills Rating (low)				
High school or less	↑	0.001	↑	NS
Some college	↑	NS	↓	NS
Bachelor's degree	↑	NS	↑	NS
Graduate work	↓	NS	↓	NS
Math Skills Rating (high)				
High school or less	↓	NS	↑	NS
Some college	↓	NS	↓	NS
Bachelor's degree	↓	NS	↓	NS
Graduate work	↓	NS	↓	0.032
Reading Skills Rating (low)				
High school or less	↑	0.014	↑	NS
Some college	↑	0.056	↓	NS
Bachelor's degree	↓	NS	↑	NS
Graduate work	↓	NS	↓	NS
Reading Skills Rating (high)				
High school or less	↑	NS	↑	NS
Some college	↓	0.002	↓	NS
Bachelor's degree	↓	0.002	↓	NS
Graduate work	↓	NS	↓	0.016
Teacher Attitude (low)				
High school or less	↓	NS	↓	NS
Some college	↓	NS	↑	NS
Bachelor's degree	↑	NS	↑	NS
Graduate work	↓	NS	↓	NS
Teacher Attitude (high)				
High school or less	↑	NS	↑	NS
Some college	↑	NS	↓	NS
Bachelor's degree	↓	NS	↑	NS
Graduate work	↓	NS	↑	NS
Absences (high)				
High school or less	↑	NS	↑	NS
Some college	↓	NS	↑	0.067
Bachelor's degree	↓	NS	↑	NS
Graduate work	↑	NS	↓	NS

NOTE: "High school or less" serves as the reference group for estimating the association between mental health diagnosis and academic achievement. Thus, the direction of the arrow for that group represents the main effect, and the direction of the arrow for the other groups represent the direction of the association relative to association for children whose parents had a high school diploma or less. P-values are reported if less than 0.100, and NS indicates a non-significant coefficient ($p > 0.10$).

Table 8.1. Directional Association between Diagnosis and Children's Exposure to Cumulative Parenting by Social Class

	ADHD		ED	
Parenting Practices	*Direction*	*Sig. (p-value)*	*Direction*	*Sig. (p-value)*
Parental School Involvement				
High school or less	↓	NS	↓	0.064
Some college	↑	0.060	↑	0.003
Bachelor's degree	↑	0.013	↑	0.000
Graduate work	↑	0.000	↑	0.000
Parent-to-Parent Contact				
High school or less	↓	0.000	↓	0.012
Some college	↑	0.026	↑	NS
Bachelor's degree	↑	0.009	↑	0.042
Graduate work	↑	0.000	↑	0.000
Child Activities				
High school or less	↓	0.000	↓	0.000
Some college	↑	0.008	↑	0.000
Bachelor's degree	↑	0.000	↑	0.000
Graduate work	↑	0.000	↑	0.000
Parent-Child Activities				
High school or less	↓	NS	↓	0.004
Some college	↑	NS	↑	0.033
Bachelor's degree	↑	NS	↑	0.009
Graduate work	↓	NS	↑	0.021
Educational Expectations				
High school or less	↓	0.000	↓	0.000
Some college	↑	0.013	↑	NS
Bachelor's degree	↑	0.000	↑	0.000
Graduate work	↑	0.000	↑	0.000

NOTE: "High school or less" servces as the reference group for estimating the association between mental health diagnosis and academic achievement. Thus, the direction of the arrow for that group represents the main effect, and the direction of the arrow for the other groups represent the direction of the association relative to association for children whose parents had a high school diploma or less. P-values are reported if less than 0.100, and NS indicates a non-significant coefficient ($p > 0.10$).

Table 8.2. Directional Association between Diagnosis and Children's Exposure to Cumulative Schooling

	ADHD		ED	
Schooling Quality	*Direction*	*Sig. (p-value)*	*Direction*	*Sig. (p-value)*
Classroom Ability (low)				
High school or less	↑	0.000	↑	0.002
Some college	↓	0.037	↓	0.042
Bachelor's degree	↓	0.000	↓	NS
Graduate work	↓	0.000	↓	0.000
Classroom Behavior (low)				
High school or less	↑	0.046	↑	NS
Some college	↑	NS	↓	NS
Bachelor's degree	↑	NS	↓	0.037
Graduate work	↓	NS	↓	0.029
Math Skills Rating (low)				
High school or less	↑	0.000	↑	0.000
Some college	↓	NS	↑	0.003
Bachelor's degree	↓	0.004	↓	0.001
Graduate work	↓	0.000	↓	0.000
Math Skills Rating (high)				
High school or less	↓	0.000	↓	0.000
Some college	↑	NS	↑	0.010
Bachelor's degree	↑	NS	↑	0.005
Graduate work	↑	0.025	↑	0.000
Reading Skills Rating (low)				
High school or less	↑	0.000	↑	0.000
Some college	↓	NS	↓	0.003
Bachelor's degree	↓	0.029	↓	0.002
Graduate work	↓	0.000	↓	0.000
Reading Skills Rating (high)				
High school or less	↓	0.000	↓	0.000
Some college	↓	0.063	↑	0.069
Bachelor's degree	↓	NS	↑	0.098
Graduate work	↑	NS	↑	0.001
Teacher Attitude (low)				
High school or less	↑	NS	↑	NS
Some college	↑	NS	↓	0.035
Bachelor's degree	↑	NS	↓	0.094
Graduate work	↓	0.018	↓	0.004
Teacher Attitude (high)				
High school or less	↑	NS	↓	0.049
Some college	↓	NS	↑	0.043
Bachelor's degree	↓	NS	↑	0.013
Graduate work	↓	NS	↑	0.003
Absences (high)				
High school or less	↑	0.000	↑	0.001
Some college	↓	0.002	↑	NS
Bachelor's degree	↓	0.000	↓	NS
Graduate work	↓	0.018	↓	0.010

NOTE: "High school or less" serves as the reference group for estimating the association between mental health diagnosis and academic achievement. Thus, the direction of the arrow for that group represents the main effect, and the direction of the arrow for the other groups represent the direction of the association relative to association for children whose parents had a high school diploma or less. P-values are reported if less than 0.100, and NS indicates a non-significant coefficient ($p > 0.10$).

Table 9. HLM Growth Curve Analysis Diagnosis by Social Class Coefficients Predicting Children's Math Scores (selected results)

	Model 1 b		SE	Model 2 b		SE	*% Change 2 v. 1*	Model 3 b		SE	*% Change 3 v. 1*
Mental Health Diagnoses											
ADD/ADHD											
x High School or less	-4.87	***	0.85	-4.67	***	0.83	*-4.0*	-2.58	**	0.82	*-47.0*
x Some College	1.35		1.12	1.79		1.10	*33.0*	1.11		1.05	*-17.9*
x Bachelor's degree	3.56	**	1.32	3.31	*	1.27	*-7.0*	1.99		1.22	*-44.0*
x Post-graduate work	5.09	**	1.63	4.81	**	1.55	*-5.5*	2.16		1.45	*-57.7*
ED											
x High School or less	-3.67	**	1.24	-3.95	**	1.20	*7.5*	-0.44		1.13	*-88.0*
x Some College	5.06	**	1.56	5.12	**	1.52	*1.3*	3.07	*	1.42	*-39.3*
x Bachelor's degree	6.77	***	1.70	6.93	***	1.64	*2.4*	3.03	~	1.57	*-55.2*
x Post-graduate work	5.95	**	1.94	6.23	**	1.91	*4.7*	0.20		1.77	*-96.7*
Time	25.83	***	0.09	25.37	***	0.10		24.79	***	0.18	
Time sq	-1.65	***	0.01	-1.58	***	0.01		-1.58	***	0.01	
Intercept	7.24	***	1.03	15.86	***	1.11		15.87	***	0.99	
Control Variables											
Controls	Yes			Yes				Yes			
Concurrent Measures	No			Yes				No			
Cumulative Measures	No			No				Yes			
n (sample size)	~16,760			~16,760				~16,760			

*** p<0.001, **p<0.01, *p<0.05

NOTE: Analyses are weighted and adjusted for sample design effects.

NOTE: Controls include parental educational attainment, race/ethnicity, mental health symtpoms, child characteristics (e.g., gender, age, health), family structure/resources (e.g., neighborhood quality, family income, biological parents in household), and family process measures (e.g., discipline, family routines, parental warmth). Concurrent measures include parenting practices (e.g., parental school involvement, child activities, parental educational expectations) and school quality (e.g., classroom ability, classroom behavior, teacher rating of skills) that were reported cotemporaneous with the dependent variable. Cumulative measures in parenting practices and school quality that are based on children's accumulated experiences.

Table 10. HLM Growth Curve Analysis Diagnosis by Social Class Coefficients Predicting Children's Reading Scores (selected results)

	Model 1		Model 2		*% Change*	Model 3		*% Change*
	b	SE	b	SE	*2 v. 1*	b	SE	*3 v. 1*
Mental Health Diagnoses								
ADD/ADHD								
x High School or less	-4.35 ***	1.07	-3.50 **	1.04	*-19.6*	-0.73	0.98	*-83.1*
x Some College	-1.20	1.43	-0.74	1.36	*-38.6*	-1.24	1.28	*3.0*
x Bachelor's degree	3.19 ~	1.68	2.51	1.56	*-21.3*	1.75	1.41	*-45.0*
x Post-graduate work	2.29	1.96	1.56	1.79	*-31.7*	-0.81	1.71	*-135.3*
ED								
x High School or less	-5.40 **	1.56	-5.54 ***	1.51	*2.5*	-0.62	1.37	*-88.5*
x Some College	5.45 **	1.85	5.51 **	1.80	*1.2*	2.60	1.63	*-52.3*
x Bachelor's degree	4.94 *	2.16	5.25 *	2.05	*6.2*	0.49	1.81	*-90.2*
x Post-graduate work	8.70 **	2.39	8.95 ***	2.31	*2.9*	1.33	2.14	*-84.7*
Time	32.95 ***	0.10	32.29 ***	0.11		30.34 ***	0.20	
Time sq	-2.27 ***	0.01	-2.18 ***	0.02		-2.12 ***	0.02	
Intercept	5.58 ***	1.39	16.94 ***	1.37		18.38 ***	1.25	
Control Variables								
Controls	Yes		Yes			Yes		
Concurrent Measures	No		Yes			No		
Cumulative Measures	No		No			Yes		
n (sample size)	~16,630		~16,630			~16,630		

*** p<0.001, **p<0.01, *p<0.05

NOTE: Analyses are weighted and adjusted for sample design effects.

NOTE: Controls include parental educational attainment, race/ethnicity, mental health symtpoms, child characteristics (e.g., gender, age, health), family structure/resources (e.g., neighborhood quality, family income, biological parents in household), and family process measures (e.g., discipline, family routines, parental warmth). Concurrent measures include parenting practices (e.g., parental school involvement, child activities, parental educational expectations) and school quality (e.g., classroom ability, classroom behavior, teacher rating of skills) that were reported cotemporaneous with the dependent variable. Cumulative measures in parenting practices and school quality that are based on children's accumulated experiences.

Figure 1.1. Parental Educational Expectations by Diagnosis Status (Concurrent)

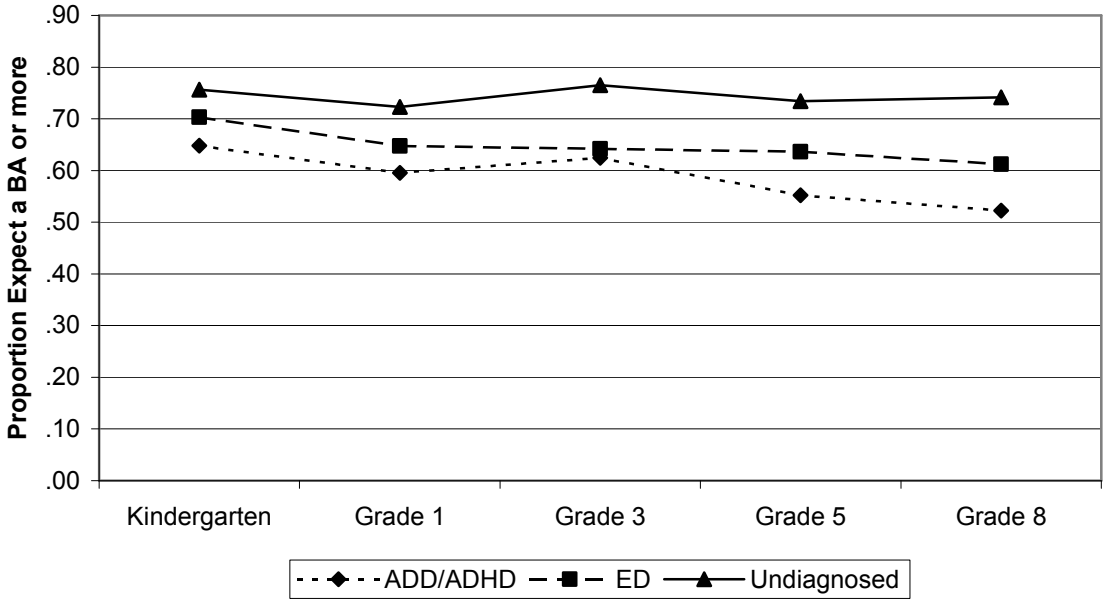


Figure 1.2. Parental Educational Expectations by Diagnosis Status (Cumulative)

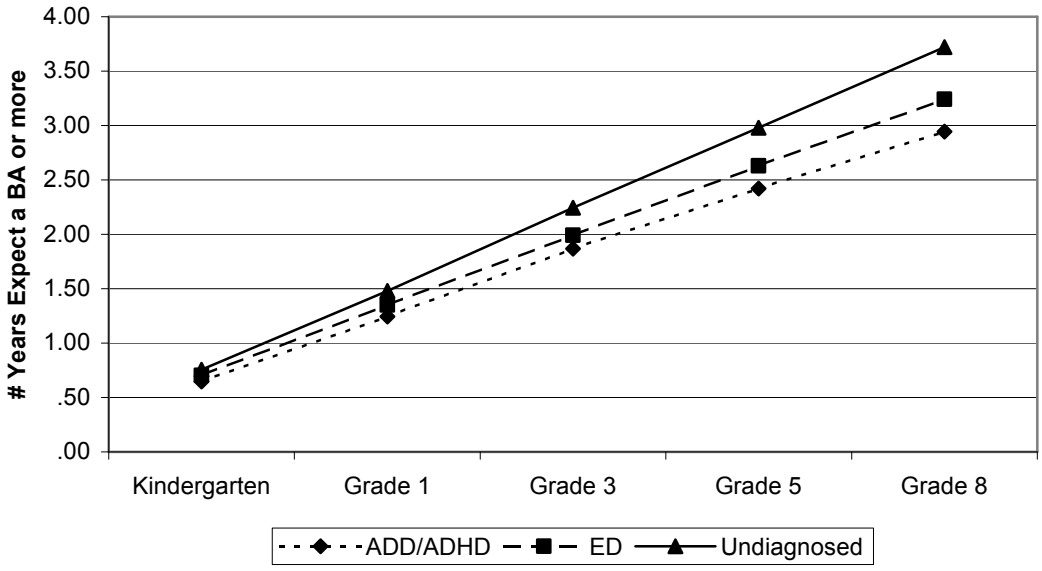


Figure 2.1. Classroom Ability Level (Lowest 20th percentile) by Diagnosis Status (Concurrent)

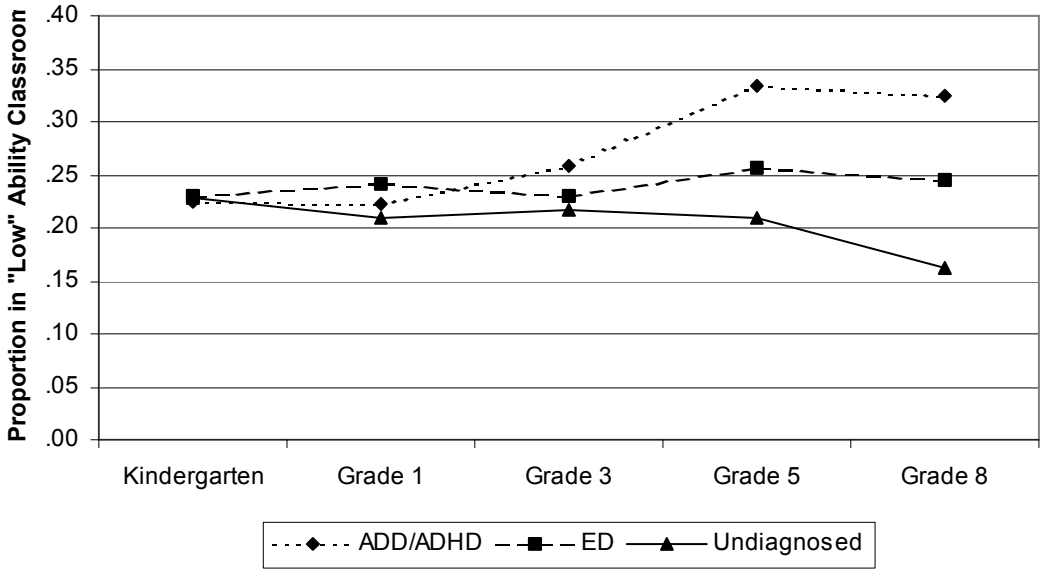
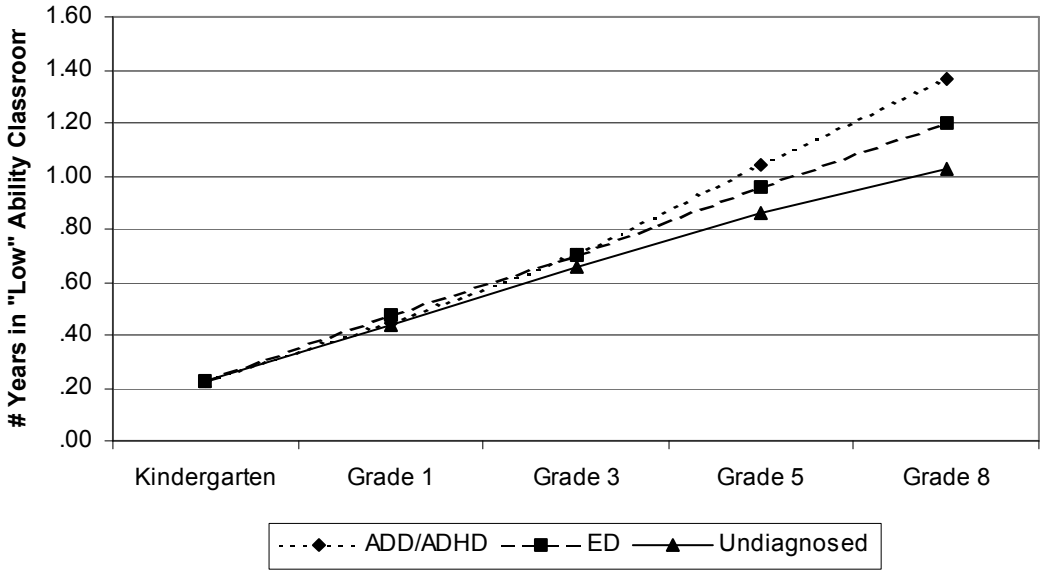


Figure 2.2. Classroom Ability Level (Lowest 20th percentile) by Diagnosis Status (Cumulative)



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Chapter 5. Conclusion

Over the last several decades, research has consistently shown an association between mental health and social status (Chen, Martin and Matthews 2006; Haas 2006; House et al. 1994; Kitigawa and Hauser 1973; Kozyrskyj et al. 2010; Miech et al. 2006; Reynolds and Ross 1998; Syme and Berkman 1976). Two commonly reported themes to emerge from these studies are that (1) individuals inhabiting lower positions in the social hierarchy tend to have poorer mental health relative to their more advantaged peers (e.g., Brown, Meadows and Elder 2007; Schmitz 2003; Strully 2009), and (2) poorer mental health is generally associated with lower status attainment. More specifically, individuals from working-class/poor families and historically disadvantaged racial/ethnic minority groups exhibit more signs of depressiveness, aggression, and psychological distress (Dohrenwend et al. 1992; Kessler et al. 2005; Kessler and Walters 1998; McLeod and Shanahan 1993), indicating the importance of social circumstances in shaping individuals' mental health. Moreover, mental health problems are in turn associated with fewer years of completed schooling, lower annual earnings, and lower overall life satisfaction (Jayakody, Danziger and Kessler 1998; Wang et al. 1999; Warren 2009), which suggests that mental health additionally contributes to the (re)production of social inequality. Although studies linking mental health and social stratification provide rather consistent findings, they tend to focus on adult populations and less frequently consider children.

Limited research on children to date suggests similar patterns to those observed among adult populations: less advantaged children have poorer mental health and poorer mental health is associated with disparities in early-life outcomes (Crosnoe 2006;

McLeod and Fettes 2007; McLeod and Nonnemaker 2000; McLeod and Shanahan 1993). This is particularly true when two "disadvantaged" statuses overlap, thus mental health problems tend to be more severe among youth from historically disadvantaged racial/ethnic minority groups living in impoverished conditions (McLeod and Owens 2004). Poorer mental health additionally detracts from children's academic success. Internalizing and externalizing problems are associated with lower reading and math skills in elementary school (Crosnoe 2006), and experiencing high levels of mental health problems during childhood or adolescence typically reduces adolescents' likelihood of high school graduation (McLeod and Fettes 2007).

However, research on mental health and social inequality, including research focused on children, has generally considered individuals' symptoms and indicators of well-being, thereby overlooking other aspects of mental health, primarily diagnosis. Over the last few decades, mental health diagnoses have gone from a fringe occurrence to commonplace practice, especially among children. It is estimated that in the United States nearly 5 million children are currently diagnosed with attention deficit disorder, attention deficit/hyperactivity disorder, or a serious emotional disturbance (e.g., depression, anxiety, social phobias) (U. S. Department of Education 2006a; U. S. Department of Education 2006b). Though still less frequently studied than mental health symptoms, diagnoses have increasingly become the focus of researchers, and studies examining the distribution of diagnoses across social groups have found rather unexpected findings.

Unlike mental health symptoms, which are inversely related to social status, evidence from prior research suggest that mental health diagnoses are more prevalent

among more advantaged children. White children and middle-class children are more likely to be diagnosed with mental health problems, such as ADD, ADHD, depression, and anxiety (LeFever, Dawson and Morrow 1999; Pastor and Reuben 2005; Schneider and Eisenberg 2006). The disjunction between the distribution of symptoms and diagnoses favoring more advantaged children has led some researchers to suggest that the criteria used by professionals during evaluations for mental health problems are biased in detecting the mental health problems of children belonging to the dominant culture. However, the disagreement between the distributions of symptoms and diagnoses also suggests that the process linking the two is imperfect, and examining it may provide insight into understanding the composition of diagnosed children. That is, in order for children to be diagnosed, they must first transition through prerequisite stages, such as attracting the concern of their parents (or guardian) and then being professionally evaluated. White and middle-class children may appear to be disproportionately represented among the diagnosed, when their greater prevalence is actually the result of their greater likelihood of transitioning through the earlier stages. The social process preceding diagnosis may thus help account for the current distribution of diagnoses among children. Prior research on children's mental health inequality has typically overlooked this process when describing who gets diagnosed.

Current evidence thus suggests that more advantaged children are disproportionately represented among individuals with mental health diagnoses; yet, most studies find that diagnoses are simultaneously associated with academic deficits. For example, Eisenberg and Schneider (2007) found that elementary school students diagnosed with ADHD had lower math and reading test scores than their non-diagnosed

peers, a gap that research has since shown increases as children age (Scheffler et al. 2009). Additionally, youth identified as hyperactive in childhood tend to complete fewer years of education than their non-hyperactive peers (Mannuzza et al. 1993). Emotional disturbances are also a marker of lower academic performance. ED children's academic skills lag behind those of their non-diagnosed peers. In middle school the gap in math and reading is equivalent to a full grade-level (i.e., the average ED sixth grader has the reading and math skills of a non-diagnosed fifth grader), and by high school the gap increases to 2 and 3 years in reading and math, respectively (Blackorby et al. 2005; Wagner et al. 2003). Furthermore, ED children have a low rate of high school completion and postsecondary enrollment (Blackorby and Wagner 1996). Mental health diagnoses thus seem to be related to children's academic achievement; however, this association is not as clearly established as prior research might suggest.

When estimating declines to academic achievement, earlier studies have often struggled to separate the unique contribution of mental health diagnoses from other attributes of diagnosed children, namely mental health symptoms and sociodemographic factors (i.e., social class and race/ethnicity). Children with mental health diagnoses tend to have more severe symptoms, and symptoms of mental health problems are negatively associated with educational outcomes. Internalizing (e.g., depressiveness, anxiety, and loneliness) and externalizing (e.g., hyperactivity, disruptiveness, and aggression) problems are negatively associated with children's early schooling success (Alexander, Entwisle and Dauber 1993; Crosnoe 2006). In addition, youth with poorer mental health are also more likely to fail a class in high school, drop out of high school, and not enroll in postsecondary education (Coutinho and Denny 1996; DiLalla, Marcus and Wright-

Phillips 2004; Ensminger and Slusarick 1992; Entwisle, Alexander and Olson 2005; Farmer and Bierman 2002; McLeod and Fettes 2007; McLeod and Kaiser 2004; Needham, Crosnoe and Muller 2004). Mental health diagnoses and mental health symptoms thus appear to be similarly associated with children's academic achievement, but diagnosis and symptoms tend to co-occur. Consequently, prior research, which has largely examined the consequences associated with diagnosis irrespective of mental health symptoms, has conflated the two. More research is needed that considers the independent association between diagnosis and achievement, net of mental health symptoms.

An extension of more clearly understanding the general association between diagnosis and children's achievement is considering the possible differential association across social groups. In their review of the literature, Trout and associates (2003) identified only 65 articles over the last forty years that examined the educational outcomes of children with mental health diagnoses, although they uniformly found that diagnosed children consistently scored lower than their non-diagnosed peers on nearly all measures of academic success. However, this research has largely examined mental health diagnoses as if they mattered the same for everyone, and overlooked the possibility that the consequences differ according to children's social background. Children from working-class/poor or historically disadvantaged racial/ethnic minority groups have access to different (and sometimes fewer) resources than their middle class and white peers. As children encounter mental health diagnoses with different resource reserves, the consequences associated with diagnosis may be altered. A more accurate depiction of

diagnosis may thus be gained by considering how diagnoses matter differently for different groups of children.

Finally, despite evidence from prior research suggesting that diagnoses are negatively associated with children's academic achievement, the process through which diagnosis is linked with educational outcomes remains unclear. A possible explanation offered by earlier research suggests that diagnosed children do less well at school because of the symptoms inherent to mental health diagnoses, such as depressiveness, hyperactivity, distractibility, and anxiety. These symptoms alter something about the child, which inhibits his/her ability to learn, thus lowering achievement (for discussion, see Wehby, Lane and Falk 2003). An alternative explanation, which focuses on children's social context, suggests that mental health diagnoses matter for achievement because the emotional and behavioral displays accompanying diagnosis disrupt children's family and schooling environment reducing exposure to quality parenting and classroom experiences. That is, the symptomatic displays of children with mental health diagnoses place added stress and strain on their parents and teachers, and despite the energies and efforts expended on behalf of these children there is often a decline in family and schooling context quality (Anastopoulous et al. 1992; Cronin 2004; Rogers et al. 2009; Solish, Perry and Minnes 2010).

While this second explanation focused on children's social context offers a reasonable alternative to accounts narrowly considering individual's characteristics (i.e., mental health symptoms) it nevertheless (1) presumes that the consequences of diagnosis are primarily attributable to changes in family and schooling context following diagnosis, and (2) has only examined the role of family and schooling factors in the overall

association between diagnosis and achievement, leaving unexplored differential effects according to children's social background. Most prior research has focused on quality of parenting practices and classroom setting *after* children become diagnosed, which implicitly suggests that family and schooling experiences occurring before the diagnosis are unimportant in understanding its consequences for achievement. It is likely, however, that the symptoms preceding diagnosis alter parenting practices and classroom quality in lieu of professional evaluation thus detracting from their benefit for children's learning and achievement. Therefore, rather than concentrate on changes to context separately over time a more informative approach may be to examine the experiences cumulatively. Specifically, the type and quality of parenting and schooling that children have prior to, during, and following diagnosis may work in a unified manner to shape the consequences associated with diagnoses.

Furthermore, if mental health diagnoses do matter differently for academic achievement depending on children's social background, then family and schooling context may additionally help account for these disparate associations. Parenting practices and classroom quality are associated with children's social class. Middle class children tend to experience a collection of parenting practices that cultivate their cultural repertories and knowledge of how to operate within the dominant social order, which provides them an evaluative advantage relative to their working-class/poor peers (Bourdieu 1990; Lareau 2003; Swidler 1986). Additionally, at school, middle class children are more likely to be placed in high-ability classrooms (Condron 2007; Gamoran 1992; Oakes 1985), and have teachers more favorably rate their abilities (Diamond, Randolph and Spillane 2004). Social class is thus related to cultivating family

experiences and enrollment in classrooms that are most likely to maximize children's learning potentials. However, whether social class continues to inform parenting practices and classroom quality for children with mental health diagnoses is yet to be seen.

This project thus examined social inequality and mental health as they relate to children's academic achievement. The three primary questions motivating this study were (1) who becomes diagnosed, (2) what are the consequences associated with diagnosis for children's academic achievement, and do they vary according to children's social background, and (3) what factors help account for the overall lower performance of diagnosed children, as well as the differential association between diagnosis and achievement across social classes? To address each of these questions, data from the Early Childhood Longitudinal Study – Kindergarten cohort (ECLS-k) were used. The answers arrived at by this study confirm aspects of earlier research, while simultaneously supplying additional insights. For example, I find that diagnosed children are more likely to be white and middle-class relative to *all* their non-diagnosed peers, but once the social process and stages preceding diagnosis are considered, race/ethnicity and social class are largely unrelated to diagnosis. Additionally, presented results suggest that mental health diagnoses are related to declines in children's math and reading test scores; however, the association between diagnosis and achievement is strongly moderated by social class and race/ethnicity. Finally, family and schooling experiences help account for the negative association between diagnosis and achievement, but most notably when parenting practices and classroom quality are considered cumulatively. In the remaining sections, I summarize in more detail the results of the empirical chapters, and discuss the limitations

of this study as well as the need for future research. I conclude with consideration of some general implications.

Summary of Results

The Social Process Behind Inequalities in Children's Mental Health: An Illness Career Framework

In the first empirical chapter, I examined the predictors of children's mental health diagnoses, which prior research has typically done by comparing the characteristics of diagnosed children with *all* non-diagnosed children. According to findings from this "traditional" approach, white and middle-class children are more likely to be diagnosed than the racial/ethnic minority or working-class/poor peers. However, such investigation implies that all children are at risk for a diagnosis, and overlooks the social process involved in becoming diagnosed. Specifically, children become diagnosed after transitioning through prerequisite stages, such as attracting the concern of a parent and then being professionally evaluated. Only then is it possible for children to be diagnosed. I thus use an illness career framework (Aneshensel and Phelan 1999) to incorporate social process and offer an alternative account of who gets diagnosed.

I conducted two analyses to determine if the illness career framework offered any novel insight. First, I used the traditional framework to estimate the association between parents' educational attainment, race/ethnicity, and diagnosis status. Second, I employed the illness career framework to estimate the same association, but incorporated the social process preceding diagnosis to determine its role in shaping the composition of diagnosed children. Using the "traditional" framework, and in line with prior research, I found that diagnosed children were more likely to be white and have more educated parents relative

to *all* non-diagnosed children. Comparatively, results from the models using the illness career framework found almost no associations. That is, among children who had similarly transitioned through the social process preceding diagnosis and attracted the concern of their parent(s) and been professionally evaluated, social class and race/ethnicity were typically no longer associated with diagnosis status.

The over-representation of children from certain social groups appears to largely be the byproduct of the processes preceding diagnosis. White and middle-class children were more likely to have parents concerned about their mental health, and of those with concerned parents, white and middle-class children were also more likely to be professionally evaluated. Consequently, once their over-representation at these earlier stages was considered, race/ethnicity and social class no longer predicted diagnosis. This process-driven explanation offers a different account of the distribution of diagnoses than prior research, which has claimed that diagnostic criteria was biased against children from less advantaged families, and culturally insensitive to their different living and social circumstances. Although the results presented herein do not dismiss concerns regarding the appropriateness and efficacy of universal mental health assessment criteria, they nevertheless propose an alternative explanation of current distribution patterns, and describe how social status and social process interact to determine which children are diagnosed.

Social Advantage and the Association between Mental Health Diagnoses and Children's Academic Achievement

After investigating the distribution of diagnoses, the second empirical chapter examined the consequences associated with attention-deficit/hyperactivity disorder

(ADD/ADHD) and emotional disturbances (ED; depression, anxiety, social phobias) for children's academic achievement. Despite consistent findings from prior research suggesting that diagnoses are negatively associated with children's educational outcomes, such studies have often conflated diagnosis with other attributes of diagnosed children. Moreover, prior research has typically only focused on the general decline associated with diagnosis, and not considered the possibility that diagnoses matter differently for children depending on their social background. The analysis for Chapter 3 thus involved two components: identifying the independent association between diagnosis and achievement net of symptoms and children's characteristics, and examining whether this association varied across social groups.

I identified all children diagnosed with ADD/ADHD or ED, and estimated the relationship between diagnosis and children's math and reading scores from kindergarten through eighth-grade, controlling for mental health symptoms and other sociodemographic characteristics (i.e., parents' educational attainment, race/ethnicity). ADD/ADHD diagnosis was associated with a decline in achievement, while the relationship between ED and achievement was non-significant or slightly positive. However, allowing the association between diagnosis and achievement to vary across social groups revealed that ADD/ADHD and ED were more detrimental for the math and reading outcomes of less advantaged children. Children whose parents were least educated experienced the largest decline in their achievement scores when diagnosed, and at incremental levels of parents' education, the negative association was reduced. A similar, albeit less distinct pattern was observed for race and ethnicity as well. The

negative consequences for achievement related to ADD/ADHD and ED were smallest for white children and largest for African Americans.

Based on these results, mental health diagnoses serve as another marker of educational inequality. Children diagnosed with ADD/ADHD tend to experience a decline in their math and reading achievement; while, ED diagnosis seems to be less detrimental on average. Importantly, the consequences of diagnosis appear to vary across groups of children. Specifically, more advantaged children tend to experience the least decline in achievement when diagnosed, and working-class/poor and historically disadvantaged racial/ethnic minority children appear doubly disadvantaged by their social position and mental health status. Thus, social advantage may not protect children from being diagnosed, but it alters the association with academic achievement.

Parenting, Classroom Quality, and the Association between Cumulative Childhood Experiences, Mental Health Diagnoses, and Academic Achievement

Finally, in Chapter 4, I explored the factors that account for the negative association between mental health diagnoses and academic achievement; specifically, considering the role of parenting practices and classroom quality. Given their severe behavioral and emotional struggles children diagnosed with ADD/ADHD or ED can be disruptive at home and in school. Diagnosed individuals may thus lower the quality of parenting practices and classroom experiences they receive because of the additional strain placed on parents and teachers.

According to this line of reasoning, diagnosis matters for achievement because it alters something about the social context of children. Most prior attempts to investigate the importance of context have typically examined declines in family and schooling

circumstances at different "snap-shots" in time. Such an approach captures ongoing changes that children may experience, but separates them over time; that is, it considers reductions in the quality of parenting practices in one year as temporally independent of changes that may occur in other years (and the same for classroom quality). Children are not likely to experience these declines separately year-after-year, but instead these changes accrue and accumulate. Thus, ADD/ADHD and ED children repeatedly experience a certain social context, which requires a cumulative framework to examine how this long-term exposure is related to the lower academic performance associated with mental health diagnosis.

I thus created two types of parenting and classroom measures: concurrent and cumulative. Concurrent measures are typical time-varying indicators of parenting practices and schooling quality that reflect wave-specific values and emphasize change to the family and school factors. Alternatively, cumulative measures are time-varying indicators of parenting practices and schooling quality that emphasize accumulated changes by summing together past and present experiences. That is, the cumulative measures capture the accrual of experiences and examine their relationship with childhood development. Based on presented results, concurrent parenting and schooling factors do not account for the decline in reading and math scores associated with mental health diagnosis, while accumulated experiences explained most of the negative association between ADD/ADHD and achievement.

Finally, I examined whether parenting practices and classroom quality could account for the differential association between diagnosis and achievement across social class. I independently examined both concurrent and cumulative parenting and

classroom quality measures, and found that concurrent processes in the home and school were essentially unrelated to the differential association between diagnosis and achievement. Alternatively, the cumulative parenting practices and classroom quality measures accounted for most of the differences in the consequences across social class, and again, explained nearly all the detriment to academic achievement associated with diagnosis. The results once again indicate that children's long-term social contexts (i.e., family and schooling circumstances) largely account for the negative association between diagnosis and achievement, and additionally explain the differential consequences across social groups.

Limitations

Although the findings from this study provide several new insights into the association between mental health and social inequality as they relate to children's outcomes, there is a continued need for further research to better understand the relationships described herein. Each chapter included its own discussion of the need for future research; nevertheless, it is worth outlining some of these in more detail, and describing more general concerns.

The use of the Early Childhood Longitudinal Study – Kindergarten cohort (ECLS-k) is a major strength of the study, although this dataset is not without limitations. As discussed in the introductory chapter, the ECLS-k is unsurpassed in its collection of family and education data over nearly 10 years during middle-childhood and early adolescence. Moreover, it is one of the few datasets that contains reports of children's professional diagnoses. Still, there are a few notable aspects of the data that, if improved upon, could further future research. Specifically, the data on children's mental health

diagnoses were taken from parent-reports rather than doctor-reports or medical records, which were not available. Future research that can verify the absence or presence of ADD/ADHD or ED diagnoses, may reveal different patterns than those reported herein. Furthermore, medical records would provide more specific information regarding the timing of diagnosis receipt, which could help clarify the temporal ordering, which is currently limited to the "calendar year" for this analysis. Additionally, future studies that measure mental health symptoms with clinical instruments, such as the Child Behavior Checklist (Achenbach and Ruffle 2000), would be an improvement over the use of parent, teacher, and child reports.

Additionally, it is worth noting the age of children included in the sample. The ECLS-k includes children who were in kindergarten in the fall of 1998, and followed them for 9 years, until the spring of 2007 (Tourangeau et al. 2006). During the first wave of the ECLS-k, the average age of the children was 5.5 years old; therefore, by the final wave the average age was about 14 to 15 years old. Although this represents a sizeable portion of children's lives, it is just a portion, and the results of this study are limited to discussion of relationships and patterns between mental health diagnoses, family and schooling experiences, and children's academic achievement during middle childhood and early adolescence. Mental health diagnoses given to children before the start of elementary school or during high school may result from different processes and have very different consequences than the ones described in this study. For example, children diagnosed with mental health problems prior to kindergarten entry may exhibit more severe symptoms than those who are not diagnosed until later. Additionally, mental health diagnoses not received until high school or college may be reflective of greater

social influences, such as parents using diagnoses to ascertain academic advantages for their children, like extended-time on tests and examinations. Future research on these different age-cohorts may thus reveal very different patterns in predicting diagnoses, as well as the consequences associated with diagnosis for academic achievement.

More substantively, the patterns and associations described in this study refer to *mental* health diagnoses. Consideration was not given to physical impairments, such as vision or hearing loss. Additionally, within the general heading of "mental health diagnoses", I focused on internalizing and externalizing diagnoses, and more specifically, ADD/ADHD and ED. Other diagnoses, such as autism, aspergers, mental retardation, substance/alcohol abuse, and learning disabilities, are not explicitly examined. Autism and aspergers are attracting increased attention, as more children are placed on the spectrum for a pervasive developmental delay (National Institute of Mental Health 2004). However, these diagnoses are not considered in this study, and may provide an interesting complement in future research to the patterns and consequences associated with ADD/ADHD and ED.

In light of the use of social statistics in this project, many of the associations described herein could be complemented with qualitative data to provide a more thorough description of the social processes at work. Studies by Blum, Cronin, and Singh used qualitative techniques to study the family and social context of children's mental health diagnoses, and make apparent the detailed description required to fully understand how ADD, ADHD, depression, and anxiety disrupt the daily lives of children and their families. In some respects, this study provides fortitude to that earlier qualitative research by statistically validating the active and engaged parenting styles that led to the

successful navigation of children's mental health diagnoses (Blum 2007; Cronin 2004; Singh 2004). However, better description of the specific behaviors and practices used by parents (and teachers) is needed in order to formulate future interventions aimed at improving the academic outcomes of diagnosed children. Future studies using mixed methods or larger-scale qualitative research would thus refine and more clearly describe the family and schooling processes of children with mental health diagnoses.

Finally, this study has not delved into the issue of the "reality of diagnosis". There is an extensive literature on the social construction of mental illness, and its association (or lack thereof) with physiological and biological factors (Goffman 1961; Scheff 1966; Szasz 1962; Thoits 2005). The social-constructivist view of mental health diagnoses proposes that diagnosis is a reflection of power and social position, in which everyone behaves in ways that could be considered "mentally ill", but only those of low status unable to protect themselves against diagnosis are actually labeled (i.e., diagnosed). In some respects, Chapter 2 can be seen as following in this line of work since it examines the role of social status (i.e., parents' educational attainment and race/ethnicity) in predicting who gets diagnosed; however, the analysis was not intended to question the existence of diagnoses, but to draw attention to the social process involved in receiving a diagnosis. Moreover, mental health symptoms were included in the analyses, and continued to predict diagnosis status across the stages of the illness career. This study thus follows a long tradition of research which presumes that medical diagnosis, although shaped by social factors, is not simply a social artifact (Horwitz 1982; Horwitz 2007; Thoits 2005). The medical aspects of diagnosis are thus a recognized and incorporated dimension of this study, as this project is premised upon the

idea that diagnoses exist, are distinct from mental health symptoms, and are informed and indicative of both social and medical conditions.

In addition to these larger issues, it is worth briefly outlining additional avenues for future research. This study primarily focused on two child-characteristics: social class and race/ethnicity. Subsequent research is needed to look at the role of other child-traits as they relate to mental health diagnoses, and specifically children's gender (male v. female) may be particularly informative given the noted disparity of diagnoses between boys and girls. Additionally, more research is needed on the intergenerational transmission of mental health diagnoses. Does having a parent who was diagnosed with ADD/ADHD or ED increase or decrease the chances a child will be diagnosed? Further, I only examined the association between diagnosis and children's academic achievement from kindergarten to eighth-grade. What are the consequences of childhood mental health diagnoses for early- to middle-adulthood outcomes, such as high school graduation and college enrollment, net of symptoms and other confounding factors? Beyond educational consequences, what are the ramifications of mental health diagnoses on other dimensions of children's lives? Does ADD/ADHD or ED influence children's peer groups, teenage employment, or dating relationships?

Implications of Study

Although there is a continued need for future research, this study has provided several advances to the current understanding of children's mental health. These include a better understanding of the role of social process in shaping who gets diagnosed, the association between diagnosis and achievement (net of mental health symptoms), and the importance of family and schooling experiences in understanding the decline in

achievement associated with diagnosis. In total, each chapter provides a progression of inquiry into social inequality and mental health, detailing the intersection and interplay of these social forces in shaping children's development. I would like to conclude this study by taking the results of the individual chapters and extending them to consider broader issues of the discipline.

Point 1. The social world importantly contributes to medical outcomes.

Given the medicalization of disability and illness (among other things) in contemporary society, mental health diagnoses can be conceived of as a medical condition, and as such, it might be expected that only medical factors would define diagnosis. The results of Chapter 2 suggest that symptoms, while often an important differentiating factor in classifying diagnosed from non-diagnosed individuals, do not perfectly distinguish between the two. Instead, the composition of individuals is shaped by the stages that children pass through in becoming diagnosed, which further supports the idea that social processes matter for defining medical conditions. Although this study only considered mental health diagnoses, there is other research similarly suggesting that social factors largely contribute to determining who is eventually diagnosed for other conditions, such as asthma, cardiovascular problems, and breast cancer (Angus et al. 2006; Kozyrskyj et al. 2010; Marin, Chen and Miller 2008). In combination with earlier research, the findings from this study serve as a reminder of the importance of social influences in nearly all facets of life, including the medical.

Point 2. Research on educational inequality should consider mental health diagnoses as a "standard" marker for academic disparity.

When researchers study "educational inequality", they are typically concerned with social class and/or racial/ethnic differences in academic performance. Results from this study suggest another "status" marker associated with lower achievement: mental health diagnosis status. Children with ADD/ADHD showed significant declines in their math and reading test scores after being diagnosed, net of mental health symptoms—though ED diagnosis was less clearly associated with achievement, especially once symptoms were considered. Still, both ADD/ADHD and ED were negatively associated with academic achievement for less advantaged children, and this "double disadvantage" provides evidence of how the intersection of statuses may compound separate detriments. Thus, similar to how mental health symptoms have become more prevalent in studies of academic achievement, diagnoses also deserve greater consideration.

Point 3. Consequences are contingent upon the social context.

In this study, children from across the social class and race/ethnicity spectrum received mental health diagnoses. No status or group membership guaranteed children of being labeled or protected them against ever being diagnosed. However, the consequences of diagnosis were not the same, and children's social class, and the experiences and exposures that define class location, were largely responsible for the differential effects of diagnosis. This pattern is reminiscent of earlier research on adolescent delinquency, in which youth from both middle- and working-class/poor families identified with and participated in a rebellious teen culture, but only working-class/poor individuals experienced a decline in their schooling achievement as a result (e.g., Hannon 2003). Middle-class children were not protected from membership in the rebellious culture, but were insulated against its negative repercussions. Similarly,

middle-class children were not protected from receiving a mental health diagnosis, but they were insulated from any resulting negative detriment to their achievement. Thus, consequences do not appear to be inherently associated with a particular status (i.e., mental health diagnosis, membership in a delinquent peer culture, etc.), but result from the social context in which the status is situated. Even though Point 2 suggests that mental health diagnoses should be more regularly considered in discussions of educational inequality, it is important to recognize that the diagnosis itself has no consequence, but that the context in which it is embedded is central to whether the consequences are negative, neutral, or positive. These results can be extended more generally to suggest that most traits, qualities, and individual characteristics are only as important as the social context allows them to be, and serves as a reminder of the centrality of the social world in all aspects of human behavior and development.

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