Beyond Medicalization: Explaining the Increased Prevalence of Attention Deficit-Hyperactivity Disorder

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ABSTRACT

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Attention Deficit-Hyperactivity Disorder diagnoses have been rising steadily since the early 1990s. Today, about 10 percent of the school-aged population has been diagnosed with the disorder, and prevalence is increasing steadily among preschool children and adults. Most of the individuals diagnosed with the disorder use stimulant medications to treat the symptoms. Both the rapidly rising number of diagnoses and the substantial variation in prevalence and treatment utilization – across states, regions, gender, race, ethnicity, and socioeconomic status – have attracted attention and raised concerns about under and over recognition and treatment.

The implicit justification for the increasing awareness and recognition of the disorder is that it is a valid clinical object that matches medically-proven treatments with those reliably expected to benefit from them. From this perspective, the uptake in prevalence results from changes in environmental determinants or scientific advances in neurology, psychiatry, diagnostic protocols, or pharmaceutical research. But a widespread argument among teachers, parents, policy makers, the general public, and academic researchers – including sociologists – is that the development and success of the disorder results from a medicalization process. Medicalization encompasses a social construction critique that contradicts the environmental/scientific advance claims, but medicalization research also emphasizes macro-level actors that forcibly advance the medical label and treatment. Traditionally, medicalization studies focused on the disproportionate power of the medical profession vis-a-vis patients, but more recently they have begun to emphasize a broader range of actors pursuing a medical label – pharmaceutical companies and even consumers influ-

enced by new forms of advertising. Those arguments assume that educational institutions act in concert with those pushing the medical label.

The goal of this dissertation is to provide an account of diagnostic prevalence and treatment utilization (and their uneven distribution) that debunks explanations based solely in science but that also demonstrates the insufficiency of the medicalization account. Together, the chapters show that there is no correlation in timing between the surge in diagnoses and the processes implied by either medicalization or scientific progress arguments, there is little support in the micro-level data for a strictly medicalization account, and there is substantial evidence that macro-level educational institutions and the school context play a significant role in reshaping the category. The chapters emphasize that the success of the category lies in the confluence of technoscientific innovation, social control of troublesome behaviors, the increased activism of parents along with direct-to-consumer pharmaceutical advertising, encroachments of the law into student discipline and into the health care industry, the institutional needs of schools, a cultural emphasis on high academic achievement, and the influence of parallel and predecessor classifications, among other factors. The category – a result of multiple institutions working to recraft expertise – is a school-specific medical disorder that includes a heterogeneous symptom complex, one that is understood differently within school and medical milieu. Although the chapters do not *disprove* medicalization, they suggest that the medicalization framework overstates the importance of medical professionals and medicine broadly defined for the success of the category.

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Introduction

In the last two decades, public attention has focused on unprecedented increases in the numbers of children diagnosed with Attention-Deficit/Hyperactivity Disorder (ADHD) and using stimulant medications to manage their conditions. On average, nearly one in ten children in the United States has been diagnosed with the disorder, making ADHD the most commonly diagnosed pediatric[1] mental disorder (Subcommittee on Attention-Deficit/Hyperactivity Disorder and Management, 2011). More than half of those diagnosed use a stimulant medication as a form of treatment (Mayes et al., 2008; Rasmussen, 2009), with sales of methylphenidate and amphetamine stimulants (sold under brand names such as Ritalin, Vyvanse, Adderall, and Concerta) representing roughly 2.3% of the entire pharmaceutical market (IMS Health, 2010).[2]

The existing sociological literature, for the most part, assumes that ADHD is *the* classic case of medical encroachment into ordinary human conditions. The ADHD classification labels deviant behavior in medical terms and organizes a response in terms of medical intervention, which has the effect of "medicalizing" a heterogeneous mix of (usually male)[3] troublesome behaviors (Castel et al., 1982; Conrad, 1975, 1992, 2007; Conrad and Slodden, 2013; Freeman, 1976; Malacrida, 2004; Rafalovich, 2007; Searight and McLaren, 1998; Smith and Kronick, 1979; Timimi and Leo, 2009). Because the disorder is defined symptomatically, by relative deficits in the areas of attentiveness, activity level, or impulse control, medical experts are said to legitimate problems in the form of a disorder to manage social institutions like families and schools (Rosenberg, 2006). Although medicalization theory has evolved to meet changing realities – most notably, the technological revolution and the increased ability of patients to become active consumers of medical treatments (Clarke et al., 2003, 2010; Conrad, 2005; Rose, 2007) – the continued perception of ADHD

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[1] Although classified as a childhood disorder, accumulating research now suggests that ADHD is a life-long disorder that persists into adulthood (Kessler et al., 2006).

[2] Some children also take atomoxetine (Strattera), selective serotonin reuptake inhibitors, or antipsychotic medications to treat ADHD or comorbid conditions; often these medications are taken with stimulant medications (Chai et al., 2012). Chapter 2 discusses the socio-economic determinants of drug type.

[3] The disorder is characterized by a significant gender skew favoring boys (Rucklidge, 2008).

as a defining example of medicalization (Conrad, 2013; Conrad and Bergey, 2014; Frances, 2013; Rafalovich, 2013) raises important questions about the influence of medical institutions on the incidence and prevalence of the disorder.

Early studies of medicalization focused on the power of the medical profession to expand into new areas for the purpose of securing adherence to social norms (Conrad, 1975; Conrad and Schneider, 1980a; Freidson, 2006; Szasz, 1974). Studies of medicalization in recent years, however, have broadened to account for the expansion of biomedicine into an even wider range of areas (and for a wider range of purposes) through advances in bioengineering, genomics, and pharmaceuticals and other technoscientific innovations (Clarke et al., 2003, 2010); studies also have started to recognize new "engines" of medicalization such as patients, pharmaceutical companies, and managed care (Conrad and Leiter, 2004; Conrad, 2005). By doing so, medicalization research has begun to de-emphasize causal claims but continues to point to a re-characterization of the modality with which a subject is approached – one that moves from moral to technical or from social to individual. The mechanical application of the medicalization framework to an ever-wider range of phenomena has led some sociologists to question its usefulness; the emphasis on the medical "frame" is said to detract attention from sites of resistance (Bury, 2006), counter trends towards demedicalization (Halfmann, 2012), and the "interplay of medicine and other dominant institutions" (Medina and McCranie, 2011, p. 139).

Arguing that the medicalization account overstates the importance of medicine (in its broadest form) for the success of the ADHD category, this dissertation takes the perspective that the application of a medical frame to a social problem "should not be the conclusion of [the] analysis" (Rose, 2007, pp. 701-702). The emergence and establishment of ADHD as a medical category is better understood as just "one interesting institutional layer of an increasingly formalized process of social control over problems in modern life" (Medina and McCranie, 2011, p. 139). Another way to say this is that ADHD a node in a broader network through which the interests of several different actors – parents, children, schools, medical professionals, pharmaceutical companies, and experts in therapeutic disciplines – are translated. The problems of inattention, impulsivity, and hyperactivity, the diagnostic category, the patient identity and behaviors in response to the category, and the various forms of expert knowledge and intervention (medical, educational, legal, or therapeutic) all are part of the network that constructs and maintains the ADHD classification (Eyal, 2013; Martin, 2007); from this perspective, expertise is not simply the possession of the powerful but is distributed across actors and ultimately is the product of negotiation among them. Accordingly, I argue that medicalization (by itself) cannot explain why ADHD prevalence has increased.

The clinical nomenclature that describes or includes the constellation of symptoms of inattention, impulsivity, and hyperactivity has changed over time; medicalization studies would say that the changing nomenclature reflects a process through which the diagnostic category expanded because of the dominance of medical approaches to the remediation of social problems. The changes, however, reflect not only increased knowledge about the nature and causes of the symptoms, but also the institutional needs of schools (including the institutional channels through which students are identified), treatment protocols, and changing socio-demographics. Furthermore, the changes in diagnostic criteria have produced changes in the types of children who are included within the diagnostic category. Those consequences, in turn, affect the range of treatment options and alter the stigma attaching to the category and to the underlying symptoms. As I will show, the success of the category (reflected in its extension – first to middle- and upper-class children and then to adults) has caused it to shift as the coalition has changed.[4]

All of this is to say that ADHD is an example of what Ian Hacking (1999) refers to as an "interactive" kind – a classificatory type that changes by means of interacting with

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[4] Conrad and Slodden (2013) argue that the expansion of the category to include adults reflects a medicalization process. But, as I will demonstrate, the expansion – particularly insofar as it has resulted in a reversal of the gender gap in treatment – is in tension with a social deviance interpretation of boy behavior. And medical expansion, in this case, occurred only after adult diagnosis had become routine.

what is classified. The argument I develop is stated succinctly by Hacking (1999, pp. 102-03):

> [T]here has been a historical succession of ideas: fidgety, hyperactive, attention deficit, and Attention Deficit Hyperactivity Disorder. Perhaps the children to which these terms have been applied over the course of this century are themselves different. Perhaps children diagnosed with ADHD are different from the children once called fidgety – in part because of the theories held about them, and the remedies that have been put in place around their bad habits. Conversely, it may be that the resulting changes in the children have contributed to the evolution of ideas about problem children.

An ADHD diagnosis interacts with individuals and families through a process that Hacking describes as a "looping effect" (Hacking, 1998). The expert-created category affects individuals and families (and groups of individuals and families), who internalize the category and alter their self conceptions and behaviors in response to it. Others – parents, teachers, and caretakers – treat the categorized individuals in accordance with the label. The altered behavior of the categorized persons also influences the experts who must modify the category to account for the new behaviors enabled by it (Hacking, 1999, p. 104). This means that the act of diagnosis is not simply the exertion of medical power; rather, the diagnosis is established and maintained within a network that reflects a prior history of looping effects (Eyal et al., 2010).

In the following chapters, I argue that ADHD is a school-specific medical disorder that includes a heterogeneous symptom complex. It is also an amalgam of medical, educational and legal perspectives. In my examination of the embedding of ADHD in schools, I do not assume that schools act as agents of a medicalization process. Instead, I examine the conditions under which schools defer to (or challenge) medical expertise. Ultimately, I show that schools are an institutional funnel that leads to a two-tier system, with different benefits associated with the diagnosis for different actors, depending on the nature of the symptoms (impulsivity and hyperactivity on the one hand, or inattention, on the other hand) and on the characteristics of the child being diagnosed (especially race, class, and gender).

I begin in Chapter 1 with a socio-historical analysis of the emergence of the category of ADHD. The problematization of poor school performance of middle class children created a new type – children whose attention problems kept them from reaching their full academic potential. From inception, disorders of attention, hyperactivity, and impulsivity have been intimately connected with other learning and behavioral disorders. The differentiation of these symptoms led to the creation of a diagnostic category comprising a loose hybrid of inattention on the one hand and behavior problems on the other. By grafting inattention onto the category of hyperactivity, psychiatrists joined behavioral and cognitive deficits in a way that distinguished ADHD from learning disabilities, intellectual disabilities, and other behavioral disorders. The category stabilized when adults began to recognize symptoms in themselves – and to ascribe the characteristics to explain their own past failings. Although the process that established the disorder can be attributed, in part, to the role of pharmaceuticals in treating the symptoms, it is far from accurate to say that medical experts exerted a prevailing influence over the creation of the category. Nor is it purely a story of pharmaceutical or technological determinism – one in which advances in drug treatment or brain imaging ineluctably led to the stabilization of the category (compare Barker, 2011, and her discussion of the use of Lyrica to validate the condition of Fibromyalgia syndrome). Chapters 2-4 pick up this point by presenting sustained empirical attention to the core questions underlying the medicalization thesis as well as the issue of collaboration (and conflict) between medical and educational experts.

Chapter 2 uses quantitative data to address the claim that ADHD results from a medicalization process in which medical professionals and pharmaceutical companies collaborate with schools and parents to produce a medical category that facilitates the control of deviant behaviors. Although scholars have recast the medicalization argument to move beyond the causal level, it is important to examine whether the density of medical professionals and the availability of medical treatments affect diagnosis, the use and types of drug treatments for children with a diagnosis, and the enrollment of children with a diagnosis in special education programs. Overall, my findings suggest that medical dominance is not a sufficient explanation for the wide variations in prevalence or treatment utilization. At best, it partially explains the success of predecessor classifications such as hyperactivity and minimal brain dysfunction, classifications that were created and controlled by psychiatrists. Although parents, schools, and other experts use medical knowledge, they also draw on other knowledge practices to seek different ends. To better understand the resulting object, I examine the extent to which racial, ethnic, socioeconomic background, and state-level resources contribute to diagnosis and treatment outcomes. In doing so, I observe class and welfare state effects. I show that there is a two-tier system in which rich parents opt for medications while poor children are funneled into special education. Then, I present evidence of a clear difference in the types of medications used for children that come from different socio-economic and racial or ethnic backgrounds. The wealthier, white children are more likely to receive stimulants, essentially performance enhancers, while poor, black children are more likely to be controlled by anti-psychotic medications or to be placed into special education programs. These findings suggest that any pre-existing coalition is coming apart at lines drawn by class. If medicalization is about social control, then it is missing the role of the stimulants. If it is about medical dominance, it is missing the influence of middle and upper class white parents. Even if ADHD began as a product of a medicalization process, I show that it is no longer quite that. It is a focal point around which there is negotiation among many different interests. The category that results is so heterogeneous that it makes little sense to refer to it as a “medical” object.

Chapter 3 uses a longitudinal dataset that tracks a sample of kindergarteners over time within the context of their schools to examine pathways to diagnosis and variations across schools. In addition, because this dataset includes parent- and teacher-reported socio-behavioral skills, I develop measures of symptoms that I use to examine the extent to which the effects of the socio-demographic predictors discussed in Chapter 2 are mediated by symptom differences across these groups. Although medicalization theory would predict that the disorder is a reaction to a behavioral problem, I show that the disorder has a very strong cognitive aspect for students in high SES groups and schools, and that this emerges not just in young adulthood, but also in the early grades. I also show that teacher- and parent-reported symptoms have independent effects on diagnosis for white, high SES children, but parent-reported symptoms have virtually no effects on diagnosis for poor, low SES children. This finding demonstrates the role that the parental clout of high SES children has on diagnosis. The impact of class on diagnostic expansion is not atypical. Ong-Dean (2006) discusses the learning disabilities category in the 1970s when there was a "high road" to diagnosis for privileged students with mild difficulties; yet once the category fully was institutionalized, the category became more heavily populated by lower class students that also had more severe difficulties (a "low road"). That pattern was influenced by the concurrent legal pressure to minimize the number of minority students being labeled with mental retardation. Of course, the association of learning disabilities with students of lower potential had the effect of repelling privileged students. I compare the trajectories of ADHD and learning disabilities in the first three chapters.

Finally, in Chapter 4, I examine the U.S. special education domain, as an active battlefield where educators contest the ADHD diagnosis and its counterpart in special education law – the Other Health Impaired (OHI) classification. I focus specifically on what happens when collaboration among professionals fails. Delving into special education due process hearings, I consider how the medical category interacts with educators and parent advocates in the context of legal disputes about accommodations and services for children with ADHD. I use the disputes to assess the nature of contestation between the interested parties and the types of claims that are validated when disputes do emerge. With this approach, I evaluate the capacity of the classification to extend into other contexts, as medicalization theory would predict. If the diagnostic category can be successfully imported into other institutional settings, it would open the door for treatment, reimbursement, and public insurance, which it assuredly does, as well as disability status and special education, where its significance is less clear.

Even though the medical diagnostic process explicitly accounts for impairment within the school setting, schools do not defer to medical insights into biological determinants of learning challenges and behaviors. I show how medical expertise is implicated in four distinct areas – diagnostic credibility and initial eligibility determinations as well as the assignment to eligibility categories, how schools determine appropriate placement for eligible students, how schools address drug therapies or the failure of children to utilize drug therapies, and the consequences of diagnosis for school disciplinary proceedings. Although medicine supplies an individualized, biological response to learning and behavioral failure, schools are loathe to provide educational programs and services to children based on a medical label if those programs and services would equally benefit students facing other (non-neurological) academic challenges. This skepticism is aggravated by public opinion about the true nature of the disorder. This analysis shows how the individualizing aspect of medicine is in tension with the law's desire to ensure a level playing field, even in the context of a statute whose cornerstone is individualization.

Chapter 1

The Origins of the Medical Model for Understanding Childhood Abnormalities of Attention, Hyperactivity, and Impulsivity

The ADHD epidemic[1] has been explained in strikingly different ways. Increased symptom levels have been attributed to environmental causes, including toxins like fluorescent lighting or lead poisoning, maternal risk factors like smoking and alcohol use, and the misuse of modern technology like excessive television watching and video game playing (Christakis et al., 2004; David et al., 1972; David, 1974; Froehlich et al., 2009; Ott, 1976; Nigg, 2009; Pasamanick et al., 1956; Smith et al., 2007; Swing et al., 2010). Some point to a gene-environment interaction that would explain both the effects of environmental influences on increased risk and evidence that ADHD is heritable (Banerjee et al., 2007; Mill and Petronis, 2008). But it is unlikely that an environmental cause would be responsible for increased prevalence of a whole aggregate of symptoms and symptom groupings (see Eyal, 2013). Another significant literature posits the *unchanging* nature of the symptoms and accounts for increased prevalence by pointing to progress in the fields of neurology and psychiatry that facilitated the recognition of symptoms (Faraone et al., 2003; Polanczyk et al., 2007, 2014; Smith et al., 2007). This explanation also is insufficient, as I discuss, both because medical advances have not always led to increased diagnostic rates and because efforts to define and re-define the category often have occurred in the face of acknowledged gaps in medical research. Moreover, the problems of distraction, impulsivity, and hyperactivity are not strictly “natural.” Hyperactivity and impulsivity obviously are context-dependent, but even distraction became a problem in a specific place and time; art historian Jonathan Crary, for example, explains that the problem of distraction emerged when distractibility was “articulated in terms of socially determined norms” as “part of the formation of a modern technological milieu” (Crary, 2001, p. 29).[2]

Social construction arguments assume that increased prevalence is not an inevitable

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[1] Popular press writers and academics have referred to the increasing prevalence of ADHD diagnoses as an “epidemic” (Clarke, 2011; Diller, 2011a; Koerth-Baker, 2013; Editorial, 2013).

[2] This premise is stylized in Nobel-prize winning work in economics. Herbert Simon – a political scientist – articulates the concept of attention economics to refer to the management of information that treats human attention as a scarce commodity (Simon, 1971), while Daniel Kahneman – a psychologist – expands on the capacity idea by proposing that performance on a secondary task depends on the difficulty of a primary task (Kahneman, 1973).

response to scientific progress or a result of higher symptom levels. Instead, ADHD prevalence is said to result from the greater availability of services and treatments and the greater understanding by parents, teachers, and children of the benefits that a diagnosis can provide (Mayes et al., 2009; Garfield et al., 2012; Olfson et al., 2003). By looking beyond natural causes and medical progress, social construction arguments make an important contribution to our understanding of the epidemic. However, because they emphasize individual-level motivations for increased prevalence, social construction arguments can only go so far; in particular, they do not specify macro preconditions – the conditions that allowed these motivations to appear for the first time in the late 20th century.

The macro precondition that has been discussed in the literature is medicalization – the power of the medical profession to define a broader range of behaviors as problems requiring a medical solution (Conrad, 1975, 1976; Singh, 2006). Evidence for medicalization is found in the predominant use of stimulant drugs to treat the core symptoms and the successive re-iteration of diagnostic criteria to cover a more heterogeneous range of symptoms. The medicalization argument, however, cannot account for increased prevalence without specifying individual-level or interactional mechanisms. Early medicalization analyses pointed to the jurisdiction-grabbing efforts of experts (Conrad, 1975, 1976), but that explanation cannot be reconciled with the fact that the weakening of the medical profession acted in concert with the construction of ADHD. The introduction of managed care, the increased advocacy of consumers, and the power of pharmaceutical companies (among other factors) have limited the ability of the medical profession to claim and treat behaviors as medical. Accordingly, more recent medicalization arguments temper the power of the medical profession with that of many other actors – biotechnology, pharmaceutical companies, managed care, and consumer activism (Conrad, 2005; Clarke et al., 2003). Yet those approaches retain a definitional emphasis on medical categories and treatments at the expense of considering whether the qualifier "medical" says much about ADHD.[3]

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[3] I argue below and in Chapter 2 that attempts to bring in new actors under loose frameworks such as

In this chapter, I examine the socio-historical context in which ADHD emerged and became a widely-used, yet heterogeneous, diagnostic category, the predominant treatment for which is stimulant drugs. In doing so, I advance an alternative explanation for the so-called ADHD epidemic. In short, I show that while the category began as a problematization of the poor self-control of poor, minority, immigrant kids, this is not how it ended up. It morphed into a problematization of achievement gaps – of the poor school performance of middle class children who were supposed to do better. This was the key condition that explains why what failed in the past, has succeeded in the present. With this shift, there finally was a strong enough coalition behind the diagnosis; in other words, the diagnosis was able to translate the interests of clients and thereby secure their cooperation. The diagnosis became a way in which middle-class parents could conceive of themselves, and also of their kids, and hence a process of looping began – which ultimately led to diagnostic changes to account for differences in ADHD patients (Hacking, 1998).

After a brief presentation of the current diagnostic criteria and the conventional history of the disorder, my account emphasizes several processes that shaped its construction and success. To begin with, I demonstrate how ADHD came to be delineated as a disorder distinct from learning disabilities, conduct and emotional problems, and intellectual disabilities, despite overlapping symptoms and uncertain etiology. The original inclusion of a large range of symptoms under the minimal brain dysfunction (MBD) label – an etiological label that grew out of research on brain injury – was useful when subjects were in institutional settings; however, it proved insufficient once experts began to respond to the

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"engines of medicalization" (Conrad, 2005) or the more heterogeneous "scientific establishment" (Clarke et al., 2003) attempt to keep the "critical" mantle of the medicalization argument – that medicine dominates and silences patients by turning human problems into technical ones and de-politicizing social relations. More fundamentally, those frameworks do not consider education or law and how those domains interact with medicine along fuzzy interfaces. As a result, they pay insufficient attention to the way that ADHD is co-produced between parents, school districts, doctors, and insurance companies such that the qualifier "medical" says little about it. To be sure, the medication itself plays a significant role – even more so than the professionals themselves; it does so because it translates the interests of all parties in most situations. Put differently, without medication, the disorder *arguably* would not exist, but medication's effects are situated in a historical place and time. The effects of the substance alone were insufficient to produce a successful diagnostic category.

cognitive and behavioral problems of children in schools. The political dynamic influencing learning disabilities and the resumption of research into the effects of stimulant drugs on children's socio-behavioral skills both contributed to the differentiation of hyperactivity and learning disabilities – even though this demarcation was never complete.

Next, I examine the progression of ideas regarding the core symptoms of what became the "medical" category of ADHD, showing that each of the major symptoms was regarded as a central symptom at different times. This process is reflected in the successive re-iteration of diagnostic criteria from DSM-II to DSM-V, which at least superficially suggests a medicalization process (Conrad and Potter, 2000). However, I argue below that the successive iterations of the category owe as much to a looping process demarcating it from other pediatric mental disorders (and thereby enhancing its clinical validity) as to expansion of the range of covered symptoms or populations.[4] I show that there is no correlation in timing between the surge in diagnoses and various processes that are implied by the medicalization thesis. And diagnostic criteria did not really change in any significant way from 1980 to 2013, so the post-1980 increase is unrelated to diagnostic expansion.

No less importantly, I show that essential aspects of the object, especially the discovery of the paradoxical effects of stimulants, were already in place in the 1940s-1950s, and yet did not give rise to a surge in diagnoses or medication use. This point is particularly important because the medical profession was at the height of its power. The advent of patients' rights groups, the anti-psychiatry movement, and managed care are associated with the rise in diagnoses, so medical dominance is inversely correlated with the epidemic. Furthermore, much of the crucial research is done not by medical researchers or biologists but by psychologists, who latch onto areas where the medical profession is weak, namely the buffer area between the mental (still controlled by psychiatry, psychoanalysis, etc.) and the physical (controlled by medicine proper). Anyway, all of this indicates that the

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[4] To be sure, the diagnostic criteria broadened (particularly when attention was added), but the successive iterations reflect an effort to increase reliability in the clinical diagnostic process when clinicians increasingly were asked to treat new types of patients.

epidemic is not the result of the power of the medical profession, but its weakness.

To conclude I examine the development of consensus in the medical community regarding the treatment of ADHD with stimulant drugs and the extension of the category to reach adults. The current "epidemic" – which started in the 1990s – has been connected with aggressive pharmaceutical marketing by medicalization theorists. Although pharmaceutical marketing has had an effect on prescription practices (King and Essick, 2013; Schwarz, 2013b), I argue that the widespread acceptance of the category cannot be explained solely by reference to trumped-up demand generated through advertising. The current "epidemic" is not the first one; there was a first wave and a moral panic about it in the 1960s, which inhibited for a while the widespread use of medications with children. It eventually gave way to a second epidemic, not because of marketing, but because of new understandings about the core symptoms of the disorder. Moreover, medical doctors were not active proponents of the category; rather, they gradually acquiesced to the combined pressure of parents, pharmaceutical companies, and schools. Parents and adolescents, with the professional advice of educators and medical experts and the mass of information available to the public, took an active role in balancing the risks of drug side effects (some quite serious such as heart problems and stunted growth) against the risks of academic failure and school disciplinary problems, all in the context of moral, political, and social issues raised by prescribing drugs to children. Increased parent activism opened the door for the extension of the category to include adults. It had been known for some time that some of the symptoms persisted into adulthood, but as the understanding of what was core shifted, parents began to identify with the category. Eventually, the diagnostic criteria were revised to facilitate adult diagnoses.[5] I show how the disorder has become a way in which adults (including parents) can conceive of themselves and also of their kids. I attribute the widespread success of the disorder to a looping process, since

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[5] To be sure, genetic research and the discovery that brain scans of adults showed similar abnormalities to those of children with the disorder greatly contributed to the extension of the category to adults, but those conditions were insufficient.

this pressure was not coming out of nowhere, and was not unrelated to medical theories and classifications, but, at the same time, the success of the category cannot be attributed exclusively to medical imperialism or technological expansion.

1.1 How the Disorder Is Articulated in Medicine

It is not easy to make sense of the historical precursors to ADHD without setting out some details about where things stand now. The first question is precisely how medical experts define the disorder today. The second is how often it is diagnosed and treated.

1.1.1 Current Diagnostic Criteria

The current criteria for a clinical diagnosis of ADHD appear in the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders, published in May 2013 (fifth edition). The previous edition (DSM-IV) was published in 1994, with a revision of the text sections giving extra information on each diagnosis in 2000 (DSM-IV-TR). Before May 2013, the criteria had not changed in nearly twenty years. Appendix Table A.1 displays the main features of the diagnostic criteria from DSM-III in 1980 to DSM-5 in 2013 (for comparative purposes); the appendix also includes a brief description of the predecessor disorders in DSM-I and DSM-II. The diagnostic category emerged with the publication of DSM-III. DSM-III was the first to refer to "attention," the first to indicate that the information used to support a diagnosis should come from the adults in the child's environment, and the first to introduce subtyping. DSM-III cleared the way for the use of rating scales based on behavioral inputs. Rating scales are provided to teachers, parents, and older adolescents or adults and are used to achieve reliability across clinicians, and their use greatly expanded the application of the diagnostic category. I discuss recommended diagnostic practices in greater detail in Chapter 4.

In DSM-5, the disorder is characterized by a triad of clinical features – hyperactivity, inattention, and impulsivity – that form the basis for three “presentations” – a predominantly inattentive presentation, a predominantly hyperactivity-impulsivity presentation, and a combined presentation. The diagnostic criteria list nine symptoms in each of the first two presentations. For children under the age of 17, six of nine symptoms are required for a diagnosis under either presentation, and six symptoms in both dimensions are required for the combined presentation; for older adolescents and adults, only 5 symptoms are required. DSM-5 replaced the subtype configuration used in DSM-IV with the presentation concept. The subtype configuration was criticized because the presentation of symptoms tends to change during development; in particular, hyperactivity symptoms tend to decline with age (Tannock, 2013). The presentation concept emphasizes the developmental variability in when symptoms “present,” while blurring the boundaries in the subtype structure. The changes in the symptom grouping grow out of the ongoing contention about the core symptoms of ADHD, as I discuss below. The symptoms must occur for at least six months and “to a degree that is inconsistent with developmental level.” Each symptom also must be present “often” as opposed to occasionally or infrequently.

Besides having the requisite number and type of symptoms, DSM-5 imposes four requirements. First, there must be some symptoms that cause impairment before the age of 12 (the age of onset requirement); DSM-5 increased the age of onset to 12 in response to the lack of research support for the prior requirement (age 7) and the difficulties that adults faced in retrospectively recalling symptoms that occurred before the earlier age (Tannock, 2013). The symptoms must be present in at least two settings (the multiple setting requirement). There must be “clear evidence that the symptoms interfere with, or reduce the quality of, social, academic, or occupational functioning” (the impairment requirement). Last, the symptoms must “not occur exclusively during the course of schizophrenia or another psychotic disorder” and should not “be better explained by another mental disorder” (the differential diagnosis requirement). DSM-5 removed the hierarchical relationship between Pervasive Development Disorders and Attention Deficit Disorders (appearing in DSM-III and DSM-IV), in which the presence of Pervasive Development Disorders would preclude diagnosis for attention deficit disorders. That change makes it more likely that co-morbid conditions will occur.

The dual presentation (formerly subtype) structure, clusters of clinical symptoms, and frequent co-existence of other psychiatric developmental disorders (Barnard-Brak et al., 2011) suggest variability in levels of severity and symptoms between individuals.[6] Even at the symptom level, where experts differentiate, for example, between incapacity for sustained attention and selective inattention (Barkley, 1997a), there is remarkable dissimilarity. There also is significant variability in symptom expression according to developmental stage and environmental factors (school curriculum and the like). The heterogeneity implies that ADHD is not in fact a singular disorder with a well-founded etiological basis, and the increased heterogeneity over time suggests expansion to reach more behaviors, arguably consistent with a medicalization process (Conrad and Potter, 2000).

Undergirding the diagnostic framework is a struggle to find a consensus as to whether behavioral manifestations of ADHD constitute a unitary or multidimensional construct. Poor behavioral inhibition is understood by some ADHD experts as the central neurological deficiency – one that provides an underlying functional basis for the complete symptom cluster (Smith et al., 2007; Nigg, 2009; Williams et al., 2010; Sagvolden et al., 2005; Barkley, 1997b). That understanding is a cognitive theory that is founded *in part* on neurological research and correlation studies utilizing brain imaging (Barkley and Lombroso, 2000; Castellanos and Tannock, 2002; Sagvolden et al., 2005). As a result, for some substantial group of experts, the scientific basis of the disorder is beyond question; a group of about 85 scientists led by Russell Barkley issued an *International Consensus Statement on ADHD* in 2002 (Barkley, 2002), which professed complete faith in the scientific validity of the disorder and flatly rejected the social construction critique:

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[6] A number of genetic disorders also present with overlapping symptoms, including Tuberous Sclerosis complex, Fragile X, Celiac's, TBI, Noonan Syndrome, congenital hypothyroidism, and velo-cardial-facial syndrome (Nass and Frank, 2010).

> We cannot over emphasize the point that, as a matter of science, the notion that ADHD does not exist is simply wrong.... To publish stories that ADHD is a fictitious disorder or merely a conflict between today's Huckleberry Finns and their caregivers is tantamount to declaring the earth flat, the laws of gravity debatable, and the periodic table in chemistry a fraud.

Other experts (more realistically) acknowledge that the assumption that all children with ADHD share the same causal etiology is "the scientific equivalent of a red herring" (Sonuga-Barke and Castellanos, 2005, p. 244); see also Nigg (2009). For these researchers, ADHD is simply a "useful clinical heuristic" because "it gets care and treatment to those who need it," but the category in fact represents "an umbrella term" for a range of "distinct but related sub-conditions" (Sonuga-Barke and Castellanos, 2005, p. 244).

Despite the lack of agreement as to a unified etiology, medical organizations and research groups, including the National Institute of Mental Health, the American Psychiatric Association, the American Academy of Pediatrics, and the American Academy of Child Adolescent Psychiatry, agree that the disorder is a valid *clinical* object, that it can be diagnosed reliably, and that the symptoms can be treated successfully with pharmaceuticals (Castellanos and Tannock, 2002; MTA Cooperative Group, 2004; National Institutes of Health, 1998; Nigg, 2009; Smith et al., 2007).

1.1.2 Epidemiological Profile

Although what is to be explained is the increase in prevalence and treatment for ADHD that has been so widely discussed, it is not easy to make sense of prevalence estimates across periods of diagnostic change. Studies conducted before the 1990s – with estimates ranging from 1 to 20 percent (Brown et al., 2001; Goldman et al., 1998; Krager and Safer, 1974; Ross and Ross, 1976; Safer and Krager, 1988; Sprague and Gadow, 1976) – rely on nonstandard criteria and convenience samples (Hoagwood et al., 2000; Rowland et al., 2002). More recently, studies have used national samples with sophisticated survey techniques, but these studies necessarily rely on parent-reported data, which might not accurately represent true prevalence (Getahun et al., 2013; Visser et al., 2013); it is well known that socioeconomic characteristics and parents' mental health conditions are correlated with parents' perceptions of the mental health of their children (Glied et al., 1997).

Recent estimates of national prevalence from the 2011 National Survey of Children's Health suggest that 11 percent of school-aged children had a parent-reported diagnosis in 2011 (Schwarz and Cohen, 2013). Centers for Disease Control and Prevention (2010) describes results from the 2003 and 2007 National Survey of Children's Health, which indicate that the percentage of children ages 4-17 years with a parent-reported diagnosis rose from 7.8 percent in 2003 to 9.5 percent in 2007 (representing a 21.8 percent increase in 4 years). Akinbami et al. (2011) describe data from the National Health Interview Survey, 1998-2009, which indicate that the percentage of children ages 5-17 years with a parent-reported diagnosis rose from 6.9 percent in 1998 to 9.0 percent in 2009 (representing a 30 percent increase in 11 years). Data on office-based visits reflect a similar pattern (Robison et al., 1999, 2002; Sclar et al., 2012; Zarin et al., 1998).[7]

Stimulant drug use also has increased, but it is difficult to pin down the extent to which this is attributable to increased distribution to children with ADHD. Estimates based on revenues or DEA quotas fail to separate use by children and adults or use by children with ADHD as opposed to other children. Further, the heterogeneity in formulations, delivery devices, and dosages makes it difficult to interpret estimates based on weight. Nevertheless, the data are instructive as to the direction of trends. Chai et al. (2012) report a 46 percent increase in the number of prescriptions dispensed for ADHD drugs from 2002-2010 to the pediatric population. Bokhari et al. (2005) report a 5-fold increase in grams per 100,000 population between 1980 and 1996 (with a 3.7-fold increase

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[7] Sclar et al. (2012) report a 4-fold increase from 1991-1992 to 2007-2008 in the number of office-based visits for children ages 5-18 with a diagnosis of ADHD. Data from the National Medical Expenditure Survey and Medical Expenditure Panel Survey, reveal that the rate of outpatient treatment for ADHD increased from 0.9 per 100 children (ages 3-18) in 1987 to 3.4 per 100 children in 1997 (Olfson et al., 2003). Olfson et al. (2014) report psychotropic medication visits doubled for youths from the mid 1990s to the late 2000s.

from 1990-1996). The Drug Enforcement Administration (2012) reports another 1.4-fold increase from 2007 to 2011. Finally, a large prescription drug manager estimates that use of ADHD medications by privately-insured individuals aged 4 to 64 rose 35.5 percent from 2008 to 2012 (Express Scripts, 2014). Although children are still the primary users of ADHD medications, the number of adults using these drugs has been increasing at a much faster pace; among adults, more women than men use ADHD medications (Express Scripts, 2014).

What can be agreed is that nationwide diagnostic prevalence and stimulant drug treatment have increased significantly since 1990 and that there probably were very few noninstitutionalized children treated before the 1970s[8]; however, it is not clear how much prevalence increased during the period of rapid diagnostic change from 1980-1994. It should also be mentioned that rising diagnostic rates do not necessarily imply that the disorder is "over" diagnosed. Studies that estimate the prevalence of ADHD-type symptoms suggest that some children with clinically significant symptoms have no history of prior diagnosis (e.g., Wolraich et al., 2014; Cuffe et al., 2005; Froehlich et al., 2007; Merikangas et al., 2010), implying under-diagnosis for at least some children. In addition, significant variation in ADHD prevalence rates across the United States and between the United States and other countries leaves open the possibility of localized differences in over- and under-diagnosis (Bokhari et al., 2005; Cox et al., 2003; Fulton et al., 2009; Polanczyk et al., 2007).

1.2 Understanding ADHD: Contested Narratives

The following account synthesizes secondary sources from several distinct disciplinary perspectives that relate to the development of ADHD and its treatment from the early 20th century to the present date. The existing literature includes the work of medical experts that is aimed at both clinicians and interested members of the public. That work generally presents the perspective of medical progress, but it also reflects the competing defi-

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[8] What is known about the extent of the use of drugs in children with minimal brain dysfunction in the 1960s comes from surveys sent to institutions for the intellectually impaired (Sprague and Gadow, 1976).

nitions and theories that underlie the diagnosis (Barkley, 2005; Conners, 2000; Ross and Ross, 1976; Sandberg and Barton, 2002). The literature also includes the work of social scientists, much of which questions the validity of the category, the influences of professional and entrepreneurial interests, politics, and technological advances on its development (Brancaccio, 2000; Lakoff, 2000; Lange et al., 2010; Mayes and Rafalovich, 2007; Neufeld and Foy, 2006; Rafalovich, 2001; Smith, 2012; Taylor, 2011), and the power of the psychiatry profession to impose its labels to describe human variation (Conrad, 1975, 2006; Lloyd et al., 2006; Schrag and Divosky, 1976; Singh, 2002; Timimi and Leo, 2009). I use both types of sources to sketch out an informed history of the disorder, attempting to accomplish three things: (1) to set out the conditions for the appearance of the symptoms, (2) to track the development in the process of thinking about these symptoms as a single medical diagnostic category, and (3) to assess what is at stake in the different ways of thinking about the category.

1.2.1 The Straight Path from Symptom Expression to Symptom Recognition to Diagnostic Standardization

It is useful first to briefly describe the "expert" story. The conventional medical history (e.g., Barkley, 1997a; Hallowell, 1994) begins with the early recognition of symptoms in the 18th and 19th centuries, continues with the 1902 lectures of English pediatrician George Still that proposed behavioral inhibition as a central deficiency, then moves to 20th century research linking brain damage or irregularity to behavioral and learning difficulties, and finally (in the 1990s) concludes with brain imaging studies, genetic research, and the "return" to the behavioral inhibition thesis. The emphasis by medical experts on the early recognition of the behaviors that eventually become symptoms of ADHD should not be surprising (Barkley, 1997a; Sharkey and Fitzgerald, 2007; Fitzgerald, 2009; Hartmann and Palladino, 2005; Hartmann et al., 1997; Kelly, 2009). By doing so, experts legitimate the validity of the medical disorder as scientific discovery. As Brancaccio (2000, pp. 165-166) explains, the "alleged unchanging nature over time" indicates that the disorder is "independent of the period or ... context" and "instead primarily due to an individual neurophysiological condition." Although most medical researchers agree that the diagnostic category emerged with DSM-III in 1980 (attention deficit disorder) and expanded successively with DSM-III-R in 1987 and DSM-IV in 1994 (attention deficit/hyperactivity disorder), the internal history does not account for the apparent surge in prevalence, particularly during the period between 1994 and 2013 (when there were no relevant changes in the criteria).

1.2.1.1 The Context for Early Symptom Recognition: Institutional Care of the Feebleminded and Emotionally Disturbed

Before the symptoms of hyperactivity, impulsivity, and distractibility could be recognized and treated, childhood deviance had to emerge as a social problem requiring a specialized response. The "idiocy" construct emerged in the late 19th century in response to the political and economic upheaval associated with immigration and expansion, which led, in turn, to a differentiation of the moral idiot and the feebleminded (Deutsch, 1949; Grossberg, 2011; Jackson, 2000; Lazerson, 1983; Trent, 1994). Population growth in the 19th century led to the first wave of institutional "care," but child "deviants" were first treated as a special group during the Progressive Era. Believing that it was important to instill traditional values in children in response to the social unrest caused by industrialization, immigration, the growth of cities, and the rapid increase in income and wealth, Progressive social reformers turned their attention to poor children as objects for scientific study and as recipients of needed reform (Smuts and Smuts, 2006; Brancaccio, 2000; Foucault, 2008; Jackson, 2000; Neufeld and Foy, 2006; Rose, 1985; Strohl, 2011; Taylor, 2011), making childhood "the critical period for learning restraint and developing a proper social identity" (Strohl, 2011, p. 28).

Among the most expansive reforms were laws that required all children to attend school. The reforms were so fundamental that Hinshaw and Scheffler (2014b) argue that they were *the* condition precedent for an ADHD "explosion." Compulsory education surely marks a turning point on the path to the recognition of many pediatric mental disorders, but this explanation is too general to explain the particular form that ADHD comes to take years later. With compulsory education came the embedding of health and social services – medical and dental inspections, free school lunches, physical education and instruction in hygiene, and the employment of social workers and mental health workers – in schools to meet the needs of the new students (Cohen, 1983; Petrina, 2006; Tyack, 1992).[9] The grade retention of significant numbers of these children provided the impetus for the first locally-funded special education programs; because of the association of learning problems with immigrants and the mentally deficient, these programs were inadequate (Lazerson, 1983).

Around the same time, children's social or behavioral problems started to be seen as a psychiatric domain. This understanding was influenced by psychotherapists such as Sigmund Freud and Adolf Meyer (Horn, 1989), and child behavioral problems were attributed to parental or environmental causes that could be improved by psychosocial treatments. The first psychological clinic that studied children with learning or behavior problems opened (McReynolds, 1987); it was used as a model by William Healy when he established the first psychiatric clinic for children in association with the Chicago Juvenile Court in 1909 (the juvenile justice system was being formed). In response to the problematization of the troublesome child (Strohl, 2011), child guidance clinics provided outpatient mental health care to children who were at risk for delinquency, many of whom were considered feebleminded (Nehring, 2004). It is fair to say that the reforms collectively represent an example of social control of poor, immigrant children.[10]

The so-called conventional historical account begins within the milieu of the Progres-

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[9] Medical professionals and women reformers, and not educators, were the main proponents of these services; as these programs became institutionalized, health and social services in schools increasingly were directed to middle-class children rather than urban immigrants (Tyack, 1992).

[10] The initial focus on saving immigrant and lower-class children at risk for delinquency eventually shifted to an emphasis on the emotional and behavioral problems of the mostly middle-class child (Eyal et al., 2010; Eyal, 2013; Horn, 1989; Jones, 2002).

sive Era. Much of the research that I describe below occurred in institutional settings (reformatories, asylums, and child guidance clinics) where many children were considered feebleminded, and those who were not had severe behavioral problems that necessitated custodial care (typically diagnosed as neurotic, psychotic, or personality disordered). Nonetheless, medical experts point to this period as the time of discovery of the symptoms and underlying theories linking the symptoms to brain pathology, symptoms which today have morphed into a medical category predominantly associated with the middle and upper classes.

1.2.1.2 Early Brain Research, Methods, and Findings

The expert medical account typically attributes the first description of the symptoms to British pediatrician George Frederick Still (Barkley, 2005; Brancaccio, 2000; Conners, 2000; Lange et al., 2010; Neufeld and Foy, 2006; Palmer and Finger, 2001; Rafalovich, 2001; Taylor, 2011),[11] who delivered a series of lectures to the Royal College of Physicians of London in March 1902, describing 43 children (Still, 1902a, p. 1008), many of whom were intellectually impaired or in institutions. Still observed that some of the children were unable to sit still and seemed unable to focus for long on any one thing. Still adopted "the view that 'effort of attention is the essential phenomenon of the will"' (Still, 1902b, p. 1166, citing William James),[12] and suggested to fellow physicians that abnormal manifestations of "moral defect" (or an impaired ability to act with "the idea of the good of all") in

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[11] Earlier medical references have been identified (Barkley and Peters, 2012; Lange et al., 2010; Palmer and Finger, 2001), but Still is the most prominent in this line of work. Among the first references to a hyperactive child are the poems of the German physician Heinrich Hoffman in 1865. Adopting a purely moral construction, Hoffman wrote about Fidgety Philip and many of the other childhood maladies he saw in his medical practice; an English translation of the poems along with illustrations can be found at http://www.gutenberg.org/files/12116/12116-h/12116-h.htm#The_Story_Flying_Robert.

[12] James's work was inspired by French psychologist Theodule Ribot who distinguished between spontaneous attention and voluntary attention (Lakoff, 2000). James, in turn, distinguished between sensorial and intellectual attention, immediate and derived attention, and passive and active attention. Although James inspired interest in attention as a topic of study in the incipient field of psychology, research on attention slowed during the behaviorist period. The study of attention returned to the forefront with Broadbent's information processing model in the 1950s (Cornish and Wilding, 2010).

children of normal intellect should be considered a medical condition “apart from any such general disorder of intellect as is ordinarily recognized as imbecility, ‘feeble-mindedness,’ or insanity” (Still, 1902a, p. 1008). Thus, for Still, attention is bound up with “the will,” a hybrid concept, with moral and physiological dimensions. The idea is that attentiveness requires an exertion of “the will” to inhibit reactions to other stimuli; the problem that immediately emerges – and remains a fundamental concern today – is the location of the boundary between pathology and ordinary distractibility or excitability. By linking qualities such as “an abnormal incapacity for sustained attention,” “memory [that] seemed abnormally defective,” and “an abnormal lack of judgment” with “a defect of inhibitory volition” (Still, 1902b, p. 1166), Still anticipated the behavioral inhibition theory, which is proposed in the 1990s as a central deficiency that joins the symptoms that comprise ADHD (Barkley, 1997b).[13] Although the initial medical account is largely a mix between “badness” and “illness,” Still did speculate that defects in inhibition might be caused by a hereditary condition or pre- or post-natal brain injuries (Still, 1902b).

In an authoritative medical text published six years later, British physician and eugenicist Alfred Tredgold developed the idea that undetected brain damage could account for behavioral and learning problems, including the inability to pay attention (Tredgold, 1916). His work received validation in the aftermath of the encephalitis lethargica epidemic. As the epidemic spread around the world, researchers observed that children who had recovered from encephalitis often showed unusual behavioral changes even in the absence of evidence of cognitive impairment (Ebaugh, 1923). Brain damage became the predominant understanding of childhood behavioral and learning problems after World War I, and, ultimately, the linkage of brain damage and behavioral and learning abnormalities resulted in the amalgamation of a vast number of symptoms under a single classification (Ross and Ross, 1976) – a symptom grouping that remained in place until the 1960s.

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[13] Rafalovich (2001) contends that George Still’s importance lies in associating feeblemindedness with children. Although that may have been Still’s main contribution at the time, he is important to medical advocates of the category because his work anticipated the behavioral inhibition thesis.

An influential study that extended this work and specifically identified hyperactive behavior was Eugen Kahn and Louis H. Cohen's 1934 piece in the *New England Journal of Medicine* describing "organic drivenness." Referring to research showing that encephalitis-induced changes in the brain-stem produced changes in personality and behavior, but also describing intelligent children and adults who were hyperactive but who had no history of neurological dysfunction, Kahn and Cohen (1934, p. 752) proposed that "there are individuals who are possessed of organic drivenness from birth, either as the consequence of a prenatal encephalopathy or injury or of birth injury, or as a constitutional variant." They said that "the impression that one gets when observing these patients, that there is an 'organic' condition, is overwhelming," where the "patient becomes a puppet at the mercy of its source, i.e. a defective brain stem" (Kahn and Cohen, 1934, p. 750). The patients seemed to have a "surplus of inner implosion," characterized by difficulty in maintaining quiet attitudes, abruptness and clumsiness of movement, and an explosive motor.

Alfred Strauss and his co-workers later conceptualized and named a specific syndrome associated with mild or undetected brain damage, although their research involved children with mental retardation. Building on the work of Kurt Goldstein, who conducted longitudinal studies of German soldiers that had returned home from World War I with brain injuries (Carrier, 1986; Hallahan, 2002), Strauss' team differentiated children with mental retardation on the basis of whether they exhibited physical brain damage or not. The children with brain lesions (referred to as the exogenous type) exhibited the behavioral problems that Goldstein had observed in the brain-injured soldiers (Strauss and Werner, 1942; Strauss and Lehtinen, 1947); the children with no discernible brain damage (the endogenous type) did not appear to exhibit any behavioral problems. The linkage of severe brain damage with severe behavioral problems was later extended to associate less severe brain damage with milder behavioral problems (Strauss and Kephart, 1955). Strauss and Lehtinen (1947, p. 107) explain that "slight noxious accidents at birth" might "be deduced only by extensive psychological and behavioral observations," meaning that the behavioral differences that were said to result from the brain trauma sometimes were used to define the existence of the exogenous type (Kavale and Forness, 1985a,b). They coined the phrase “minimal brain damage” to describe children with restless and inattentive behavior for whom brain damage was unobserved.

Mild brain damage also was used to explain speech and language problems and distractibility. Franz Joseph Gall, a German anatomist, drew attention to the idea of the localization of brain functions, and although his ideas were largely discredited due to his association with the phrenology school, European researchers furthered his work in the area of speech aphasia (Hallahan, 2002). Other European researchers such as James Hinshelwood began to study “word blindness,” both due to acquired brain damage and to congenital causes (Hallahan, 2002). In the 1920s and 1930s, an American neurologist, Samuel Orton, relying on Hinshelwood’s work, associated various language problems in brain-damaged individuals with particular parts of the brain; Orton hypothesized that the same problems in otherwise intelligent children indicated a similar brain dysfunction. Strauss and Werner (1942) conducted a series of experiments in which they compared the performance of children with exogenous and endogenous mental retardation on a variety of figure-background tasks, where each child was shown slides of familiar objects embedded in backgrounds at fast exposure times; children in the brain-injured group were more likely to refer to the background and were less likely to recall the figure correctly, which they saw as evidence of distractibility. Another colleague, William Cruickshank, demonstrated that cerebral-palsied children had difficulties with abstraction, thus linking brain injury to cognitive difficulties for children without low intelligence (Carrier, 1986).

In the conventional account, subsequent events followed in a fairly straight path from what came before, largely by happenstance, with validation from new imaging technologies and inferences drawn from the effects of the stimulant drugs. So, around the time of the development of the MBD label, Charles Bradley discovered the calming effects of stimulant drugs on hyperactive children. The diagnostic label “minimal brain damage” was changed in the 1950s and 1960s to “minimal brain dysfunction,” reflecting the presumption of a neurologically-based deficit in the face of limited evidence of brain damage in most cases. The increasing recognition of hyperactivity as a symptom of “minimal brain dysfunction” in the 1960s prompted the change of the diagnostic label to “hyperkinetic reaction of childhood.” With the publication of DSM-III, the label “Attention Deficit Disorder” was adopted and subtyping became possible, which reflected the understanding (largely attributed to Virginia Douglas) that inattention was in fact the primary symptom. With the first revision of DSM-III, the subtyping distinction was eliminated and the diagnostic label changed to the current ADHD, reflecting lack of certainty in the medical community about the existence of the two subtypes. In 1994, with the publication of DSM-IV, the label remained the same but subtypes were again included in the diagnostic framework to reflect the broad variation in children with attentional disorders. Finally, in 2013, because of genetic research showing that the disorder “runs” in families, brain imaging research, and longitudinal studies showing that symptoms can persist into adulthood, the criteria were revised to facilitate the diagnosis of adults with ADHD.

1.2.2 The Winding Path From Institutional Social Control to Performance Enhancement of Middle Class Children

1.2.2.1 Early Use of Stimulant Drugs in Children and Its Discontinuity with the Current Epidemic

One weakness of the conventional story is its failure to account for the discontinuity between the early use of stimulant drugs in children and the later surge in prescription rates. This discontinuity arose out of the circumstances in which the early use occurred.

As part of a trend toward a specialization and hospital-based, technologically-oriented treatment, as well as a shifting interest towards providing psychiatric treatment for children with emotional problems, the first residential treatment centers for children in the

United States were established in the 1930s to care for and treat children with post-encephalitic behavior disorders and related conditions. Some were converted orphanages and reformatories; others were residential units operated by child guidance clinics or children's units of adult hospitals (American Psychiatric Association, 1957). While child guidance teams – staffed with social workers, psychologists and psychiatrists – evaluated all of the developmental and contextual factors affecting children (Jones, 2002; Kanner, 1957), the residential centers treated children with behavioral problems like those found in child guidance clinics (school difficulties, hyperactivity, and oppositional behavior) alongside children with neurological diseases. Residential treatment centers for children also incorporated medical technologies including extensive physical exams, blood tests, pneumoencephalograms, electroencephalograms, and hormone and shock treatments.

Charles Bradley was a psychiatrist and the medical director of the nation's first residential psychiatric hospital for children, the Emma Pendleton Bradley Home for Children in Rhode Island, which opened in 1931. Admitting children with brain injuries, post-encephalitic and convulsive disorders, and severe emotional and behavioral disorders (Bradley, 1936, 1944), the Bradley Home was founded at the intersection of "a broad-based social movement emphasizing the whole person, the social context, and moral development" and "an invigorated medical profession conceptualizing children's misbehavior in organic terms" (Bromley, 2006, p. 383). It is within that setting that Bradley is said to have discovered the paradoxical effect of stimulant drugs on children with behavioral problems. Bradley's research on Benzedrine (a stimulant drug manufactured by Smith Kline and French) was a byproduct of the pneumoencephalography used to document brain damage, a procedure that often caused headaches. Bradley believed that a stimulant drug like Benzedrine might reduce these headaches by stimulating the choroid plexus to produce spinal fluid; however, he detected a different kind of effect. In the first week of Benzedrine treatment, about half of 30 children receiving the drug had "remarkably improved school performance," characterized by greater interest in school material, drive to accomplish the work, speed of comprehension, or accuracy (Bradley, 1937, p. 582).[14] About half of the children also responded to the drug by becoming subdued; this was viewed as "an improvement from the social viewpoint" (Bradley, 1937, p. 579). The academic and behavioral changes appeared promptly when the Benzedrine was given and disappeared when it was discontinued. Bradley referred to the effect as "paradoxical" because a stimulant drug produced subdued behavior in children that were overactive (Bradley, 1937, p. 582).

Relying on electroencephalographic (EEG) technology, Bradley speculated that Benzedrine aroused the impaired cortical activity and induced increased voluntary control. As Bradley (1942, p. 773) explains, the EEG provides "clues as to what brain regions are involved in ... abnormal activity," which "even in the absence of gross neurological signs ... reveals central nervous system instability or disease not otherwise demonstrable." Using EEGs, Bradley and his team observed that children with severe behavioral problems tended to have abnormalities of brain rhythms (Jasper et al., 1938). They also found that the group that had a clinical response to Benzedrine tended to have a particular form of EEG abnormality (Cutts and Jasper, 1939; Bradley, 1942). However, there was no relationship between the effects of Benzedrine on observed behavior and changes revealed in the EEG while using the drug (Cutts and Jasper, 1939; Bradley, 1942). When Benzedrine responses and EEG results appeared to be complementary, Bradley defined misbehaviors according to their pharmacological response pattern and neuroanatomical features. In other words, Bradley used the data to justify interventions to parents and to investigate boundaries around a new diagnostic cluster associated with epilepsy. Fully aware of the preliminary nature of the findings, Bradley did not use the technology to diagnose or to determine who to treat (Bradley, 1942; Bromley, 2006). For Bradley, the significance of this new technology was two-fold. First, he believed that EEG abnormalities could not be

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[14] In a follow-up study, Bradley and Green (1940) found no significant effects of Benzedrine on the intelligence scores of 21 children; they suggest that the improvements in classroom performance documented in the earlier study likely resulted from the drug's effects on the emotional attitude of the children towards the tasks they were asked to perform.

produced by psychological factors alone, which meant that “faulty handling on the part of [the child’s] parents or teachers” and “emotional trauma” could be disentangled from neurological signs (Bradley, 1942, p. 774). Second, Bradley believed that EEG could be used to legitimate the expert judgment of child psychiatrists as to the need for pharmacologic treatment (Bradley, 1942).

The first report of Bradley’s observations appeared in the same journal in which another study documented improved achievement and intelligence test scores from Benzedrine (Molitch and Eccles, 1937). Smith Kline and French (SKF) Laboratories supplied Matthew Molitch and colleagues with Benzedrine so that they could perform a placebo-controlled experiment on a group of boys (ages 11 to 17) that were committed to a group home for juvenile delinquency. SKF took greater interest in the work by Molitch; while Bradley believed the amphetamine effect depended on a brain defect, Molitch characterized his subjects as biologically normal juvenile delinquents (Rasmussen, 2009). The children tested after taking Benzedrine showed greater improvement than those taking a placebo.[15] Although those studies foreshadowed later research on the effects of stimulants on a broad range of cognitive and behavioral outcomes, they had little influence on research for more than a decade (Bradley, 1950). The use of psychotropic drugs with children was sufficiently controversial that pharmaceutical companies at the time were not interested in financing research in the area (Mayes and Rafalovich, 2007; Rasmussen, 2009).

What is most salient here is what did *not* happen. Despite the emerging clinical concepts associating mild brain damage with emotional and behavioral abnormalities, the discovery of the so-called paradoxical effects of stimulant drugs on children with these abnormalities, and the technology that allowed psychiatrists to link the responses of the drug to neuroanatomical features of the brain, hyperactivity did not emerge as a social problem and would not do so until much later. The conventional account has no explanation

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[15] The experiment by Molitch and Eccles was motivated by a similar study conducted on a group of 48 adult patients in a mental hospital. Both Bradley (1937) and Molitch and Eccles (1937) refer to contemporaneous studies that describe the effects of Benzedrine on the behavior of adults.

for the delay. As explained below, there was insufficient impetus for the development and expansion of a medical category or treatment at that time because the symptoms were not of concern to educators (Kiger, 1985; Smith, 2012). Medicalization also cannot explain the failure of the category to emerge; the children involved in these studies were under institutional control, and there was no strong opponent to medical expansion.

1.2.2.2 From Brain Damage to Disability

The alternative accounts – the expert medical and medical power explanations – are not able to explain what happens next: the emergence of the disability identity and the problematization of unexplained underachievement. As a result, neither of those accounts can explain the construction and success of the ADHD category.

Convergence of Child Guidance and Care for the Feebleminded Child After World War II, the importance placed on family life, coupled with a growing recognition that "feeblemindedness" could affect children of all social classes, led to a reconceptualization of the care of feebleminded and troublesome children. Initially, the concerns about the strains that feebleminded children placed on families led to an increase in the institutional care of mentally deficient and mentally ill children regardless of social background (Eyal et al., 2010; Horn, 1989; Trent, 1994). But following a brief period of increased institutionalization of middle class children with intellectual disabilities (from about 1945 to 1955) was a massive shift towards deinstitutionalization, the effect of which was to "scramble" the categories that reflected the needs of custodial institutions and replaced them with an "undifferentiated mass of 'atypical children'" (Eyal et al., 2010, p. 3). As a result, etiology became secondary to the process of differentiating groups of children that presented unique challenges outside of custodial environments, including classrooms.

The shift in thinking of feebleminded children as a "threat to the social order" (Trent, 1994, p. 292) to seeing them as children with handicapping conditions cleared the path for an expansion of special education (Grossberg, 2011). Special education for intellectually-impaired children increased by more than a factor of 4 from 1948 to 1966 (Trent, 1994). Although these programs remained underfunded and were segregated from general education environments (see Chapter 4), the institutions put in place ultimately facilitated the development of special education programs for children that had less severe behavioral or learning challenges (Lakoff, 2000; Neufeld and Foy, 2006).

Changes in the Labor Market Increase Academic Standards The labor market transformation that began in the late 1950s contributed to the formation of identities around school-specific disabilities (Kiger, 1985; Smith, 2012; Ong-Dean, 2009). A technological revolution that began in the 1950s with the first advances in digital technology and (to some extent) the Sputnik launch stressed the necessity of an educated populace and provided a focal point around which debates about school standards would occur (Sleeter, 2010). During the presidential terms of John F. Kennedy and Lyndon B. Johnson, the federal government began spending substantial amounts on public education, and in 1965, the most extensive federal legislation affecting schools – the Elementary and Secondary Education Act – was enacted, with an emphasis on equal access to schooling and equal opportunities to achieve. Reading and math standards were raised, and standardized tests were revised to reflect the higher standards; at the same time, ability grouping and tracking were implemented to facilitate the ability of students to meet the standards (Sleeter, 2010, 1986). With the increased emphasis on achievement came a restriction on the independence of children. This transition was particularly difficult because it represented a radical break with the past; where childhood in the American frontier had represented a time of youthful independence, children in the post-war technological revolution tend to be "overcultivat[ed]" (Fass, 2011, p. 18). The growing dependence on education necessitated a significant change in children's behavior: children needed to be less "spunky" to succeed in the competitive schooling environment (Fass, 2011, p. 15).

Medical and Educational Models of Disability The problematization of achievement gaps – and particularly unexplained underachievement – provided the impetus for a new coalition of educators, medical experts, and parents to emerge whose aim was to articulate an educational response to moderate learning and behavioral problems, in the face of lingering etiological uncertainty. This was the key macro condition that explains the discontinuity between Still - who was trying to create a category for the moral disinhibition of the poor and minorities ("badness" in the medicalization jargon) – and the new coalition around ADHD, which emerges in an entirely different setting and due to a different problematization of school performance.

What follows was a series of debates about a valid nomenclature for childhood learning and behavioral disorders (Carrier, 1986; Smith, 2012). Some researchers had become troubled by the idea of inferring brain damage without any evidence of trauma or disease (Laufer et al., 1957), and felt that using an etiological nomenclature overemphasized the contributions of brain injury to the symptom complex that was emerging. Others were dissatisfied with the heterogeneity of symptoms found in brain-damaged children and preferred a functional approach that emphasized symptoms (Stevens, 1957). Three sets of substantially overlapping categories were proposed (Freeman, 1976), and the next two decades were characterized by efforts to distinguish medical and educational treatments, etiological and descriptive diagnostic categories, behavioral and cognitive deficits, and normal and abnormal symptom levels. In addition, because of a renewed interest in child pharmacology, stimulant drugs influenced the delineation of categories. I start with a brief note about the evolution of child pharmacology, and then turn to a discussion of the proponents and substantive arguments involved with each disability model.

Evolution of Pediatric Pharmacology The use of psychiatric drugs for the treatment of adults with severe mental illness was both a cause and an effect of deinstitutionalization. But the increased use of psychiatric drugs in adults led to a resurgence of interest in the use of drugs for behaviorally disordered and emotionally disturbed children. The only substantial source of research funding for pediatric psychopharmacology in the 1960s was the National Institute of Mental Health (NIMH) (Mayes and Rafalovich, 2007). The NIMH created the Psychopharmacological Research Branch (the PRB) in 1956 (Mayes and Rafalovich, 2007). In the same year, the NIMH sponsored a conference on the use of drugs in children with psychiatric problems, a leading voice at which was Leon Eisenberg (Leo Kanner's colleague at Johns Hopkins),[16] who had received the first grant for research on child psychopharmacology in 1958 for a study involving tranquilizers. Eisenberg recruited Keith Conners, and they conducted several studies of the effects of Ritalin on emotionally disturbed children that were published during the 1950s and 1960s (Conners and Eisenberg, 1963). Ritalin was approved by the Food and Drug Administration for use in children in 1961,[17] and psychiatrists began to prescribe Ritalin alongside therapeutic approaches for the treatment of hyperactivity and MBD (Rasmussen, 2009; Freeman, 1966).

The growth in the use of pharmaceuticals in the 1960s and 1970s can be attributed in part to breaking down socio-demographic divisions that had plagued the child psychiatry field since its inception. Many of the early stimulant drug studies still centered on children in institutional settings. But in 1963, Conners and Eisenberg published a study that considered the effects of Ritalin on emotionally-disturbed children, which reported significant effects over a 10-day period, the largest of which related to outwardly-directed behaviors; measures of learning showed only moderate improvements. By the mid to late 1960s, the research was extended to school children in the inner city; Conners et al. (1967) studied

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[16] Kanner's work on autism formed the foundation for the subfield of child psychiatry, which was situated at the intersection of mental illness and intellectual disability (Eyal et al., 2010). Kanner wrote the first child psychiatry textbook and headed the first child psychiatry department. Eisenberg later succeeded Kanner as the chair of that department (at Johns Hopkins).

[17] The FDA has had an impact on clinical nomenclature. In 1970 the FDA determined that behavioral symptoms should not be used to indicate drug use for hyperactive children; yet, by 1975, the FDA had decided that the diagnostic label minimal brain dysfunction was too vague and that symptoms should be listed to indicate stimulant use (Kiger, 1983). This cleared the way for full-fledged behavioral diagnosis.

children having significant difficulties in their school work or their classroom behavior in two severely disadvantaged Baltimore elementary schools. Then, in 1969, Conners et al. studied a predominantly white sample of children referred to an outpatient psychiatric clinic with learning problems or behavioral disturbances; this study found effects over a 4-week period in achievements scores, perceptual abilities, and parent-reported symptoms of impulsivity and concentration.

Around this time, Dr. Conners became intrigued by explaining the heterogeneity of symptoms exhibited by children and the need for drug research to account for that heterogeneity. To that end, he collected data on children from the general population and children with an existing symptom list who were referred to clinics. Using the data, he eventually published the first version of the Conners' Parent Rating Scale in the 1970s and started using those scales in drug studies with children (Conners et al., 1969; Conners, 1973). Conners' scale treated a score over a given threshold as discrete clinical entity, which made sense for drug studies; the success of the scale, however, facilitated a categorical approach to diagnosis in later years. By the end of the decade, the potential market for stimulant drugs had widened because of these studies, and drug therapy for children of all backgrounds gained widespread medical support and public acceptance.

Minimal Brain Dysfunction (MBD) Growing out of the minimal brain damage label used by Strauss and his colleagues, the term minimal brain dysfunction (MBD) syndrome represented the status quo. It was used to describe a broad group of childhood behavioral and learning disorders that were presumed to be caused by brain injury (Barkley, 1997a; Conners, 2000; Ross and Ross, 1976; Wender, 1971). The Oxford International Study Group on Child Neurology recommended the use of the term in 1962. In 1966, three task forces were convened by the U.S. Department of Health, Education, and Welfare to consider issues related to the educational and medical resources required for children who "show deviations of intellect and behavior" (Clements, 1966, p. 1). The first task force, composed primarily of medical professionals, saw as its charge the development of a nomenclature that would “rectify professional disjuncture,” given that the “luxury of waiting until causes can be unquestionably established” could no longer be afforded (Clements, 1966, pp. 6-7). Proceeding in a wholly etiological vein, the medical task force accepted the term “minimal brain dysfunction” and used it to describe children with “various combinations of impairment in perception, conceptualization, language, memory, and control of attention, impulse, or motor function” (Clements, 1966, pp. 9-10). The task force report listed 38 terms related to the conditions grouped as minimal brain dysfunction, some of which referred to organic aspects and the others to characteristics or consequences. Hyperactivity was considered a characteristic of a more general symptom complex (Clements, 1966, p. 13). MBD thus represented a strictly neurological approach that subsumed environmental factors, socio-economic influences, and descriptive labels within a broader neurological frame (Lange et al., 2010; Shorter, 1996; Smith, 2008).

Although MBD encompassed a broad and heterogeneous set of symptoms, an important advocate of the label, Paul Wender, suggested that MBD should be understood as a syndrome that included two major areas of dysfunction – behavioral and perceptual-cognitive, either or both of which could be present in a particular child (Wender, 1975). Behavioral problems included motor difficulties, poor impulse control, difficult interpersonal relations, or emotional abnormalities; perceptual-cognitive problems included difficulties in learning reading, spelling, and math. Observing that attentional difficulties could be considered either behavioral or perceptual-cognitive, Wender (1975, p. 47) said that the proper categorization should be seen as “moot” because “[a]ttentional difficulties are present in most, if not all, MBD children.”[18]

Wender went on to suggest a type of differentiation by treatment when he explained

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[18] One way to think about this duality is that the perceptual-cognitive dysfunctions of MBD became learning disabilities/disorders, while the behavioral ones were picked up mostly by ADHD. However, this understanding does not account for the way that attention disorders have been interpreted and re-interpreted over time to include both cognitive and behavioral dimensions.

that learning difficulties could be caused by attentional or cognitive deficits (or both), but "[a]ttentional deficits may often be largely eliminated through the use of medication" while "perceptual-cognitive deficits demand special educational remediation" (Wender, 1975, pp. 50-51). Referring to the use of psychotherapy without stimulant drugs as malpractice, Wender (1971, p. 114), in his monograph *Minimal Brain Dysfunction in Children*, espoused a view towards stimulant drugs that resonates with the claims in the medicalization literature about the asymmetry between experts and lay actors (Conrad, 1975):

> In the treatment of the MBD child the unsophisticated and unpsychologically oriented family may for once be advantaged. Not exposed to psychiatric "oversell," they may retain a child-like belief in the existence of a magic medicine that can solve problems. Since such "primitive fantasies" are often correct for the MBD child, their attitude is pro-therapeutic.

MBD thus was strictly within the jurisdiction of medical professionals, largely (but not entirely) etiological, and mostly antagonistic to the autonomy of parents and children.

Hyperactivity, Hyperkinetic Impulse Disorder, and Hyperkinetic Reaction to Childhood While proponents of the MBD label such as Clements and Wender advocated for an etiological understanding of childhood learning and behavioral disorders, another group of researchers began to promote a functional label based on behavioral symptoms, where certain behaviors were seen as symptoms and as organizing constructs for a unique syndrome. These researchers placed increasing emphasis on excessive motor activity as a central symptom of this new syndrome (Barkley, 2005; Chess, 1960; Safer and Allen, 1976; Stewart, 1976). Maurice Laufer et al. (1957, pp. 38, 48) proposed the term "hyperkinetic impulse disorder" to describe a behavioral disorder characterized by "hyperactivity; short attention span and poor powers of concentration; irritability; impulsiveness; variability; and poor school work," based on the view that hyperactivity was "the most striking" symptom displayed by the population of children that he had studied.

Laufer's research not only represented a compromise between educators and medical experts but also focused attention on the effects of stimulant medications. Laufer's team used photo-Metrazol tests to validate the neurological effects of stimulant drugs (Laufer et al., 1957; Laufer and Denhoff, 1957). In the tests, he administered Metrazol (a convulsive drug) intravenously while flashing lights at the patients. The response in the EEG was recorded, and a low threshold response was considered an indicator of dysfunction of the diencephalon, a subcortical structure (Laufer et al., 1954). Laufer selected samples of emotionally-disturbed children and divided them into two groups – an experimental group of children who presented with hyperactive symptoms and a control group of children who were not hyperactive. Although the photo-Metrazol levels were collected for both groups, only the hyperactive group was given amphetamine stimulants; the amphetamines resulted in a rise of the mean photo-Metrazol threshold to the level previously associated with the control group. This aspect of the design obscured the possibility that the amphetamines would affect the control group in a similar way (which turns out to be the case). Nevertheless, Laufer's team concluded that amphetamines were acting upon the diencephalon, which implied that diencephalon dysfunction was a cause of hyperactivity.

The primacy of hyperactivity over other symptoms was influenced not just by the response to the stimulant drugs, but also by the characteristics of the subjects of the research. Maurice Laufer, Eric Denhoff, and Gerald Solomons were researchers at the Bradley Home where the early Benzedrine studies had been done. They worked with emotionally disturbed children for whom learning problems likely were secondary to behavioral issues. Laufer's team also believed that the disorder would be "overcome by the operation of normal maturational processes," so they were looking specifically at symptoms that were characteristic of younger school-age children (Laufer et al., 1957, p. 48).

It also is important to observe, that, unlike Wender, Laufer and many other psychiatrists believed that stimulant drugs should be used in connection with psychotherapeutic approaches rather than as a substitute for them, except in cases where the family might not be able to afford other treatments. His team was aware that parents were seeking organic causes and was concerned that parents and pediatricians would misinterpret his findings to suggest that stimulants were a cure-all. Laufer et al. (1957, p. 47) noted that in most cases "there is a definite need for psychotherapy for the child and work directly with the parents" and that "it is important not to allow the parents to place sole emphasis upon an organic factor as a means of dismissing any responsibility for making changes in the situation." Writing to pediatricians, Laufer and Denhoff (1957, p. 474) advocated concurrent use of stimulants and psychotherapy, observing that "[a]mphetamine has a specific role, but is no substitute for psychotherapy." Following up on Laufer's work, Freed and Peifer (1956, p. 22) justified the use of drugs in addition to psychotherapy only where there is a "need to improve a situation, such as individual misbehavior in a school room" and children come from broken homes, rendering psychotherapy "impossible."

In sum, the hyperactivity label had the advantage of eschewing etiology, while retaining an organic foundation that allowed it to be linked to stimulant drugs. With this balance, the category potentially was attractive both to educational interest groups that preferred application of a medical model to children with behavioral problems in the classroom (Kiger, 1983) and to those that preferred functional labels. It was not, however, preferred by any of the U.S. Department of Health, Education and Welfare task forces. Moreover, the hyperactivity label did not satisfy researchers who were beginning to suspect that learning issues were associated with hyperactive behaviors and preferred a wholly functional approach to problems that were emerging in modern classrooms.

Learning Disabilities Educators preferred a third label – learning disabilities – because it deemphasized brain function and directed attention to the learning and behavioral issues confronting teachers. Before the 1960s, only minor consideration had been given to the learning problems of children, but heightened academic standards established in the 1950s and 1960s placed new emphasis on them. As educators tried to explain the failure of lower class and minority children to meet the new academic standards using concepts of cultural deprivation, emotional disturbance, or "slow" learners, the inability of educators to explain the failures of white middle class children motivated groups of parents to call attention to the earlier research on brain injury. Parents formed organizations across the United States in support of the "brain-injured child," the "perceptually handicapped," and the "neurologically impaired." In 1963, the Fund for the Perceptually Handicapped in Evanston, Illinois sponsored a conference for parents from various similar organizations (Sleeter, 2010). Dr. Samuel Kirk, an education professor at the University of Illinois,[19] opened the conference with an influential address. Although he advocated against the use of technical labels and preferred to describe the behaviors of children in a way that was meaningful to educators (Hallahan and Cruickshank, 1973, p. 6), he adopted the term "learning disability" to describe those children with "retardation, disorder, or delayed development in one or more of the processes of speech, language, reading, writing, arithmetic, or other school subjects resulting from a psychological handicap caused by a possible cerebral dysfunction and/or emotional or behavioral disturbances" that was not caused by "mental retardation, sensory deprivation, or cultural or instructional factors" (Kirk and Bateman, 1962, p. 73).[20] As originally conceived, the label included children whose deficiencies resulted from behavioral or emotional disturbances (largely the middle class, child guidance group) and excluded those children whose deficiencies resulted from cultural deprivation or mental retardation (largely the lower class, feebleminded group) (Carrier, 1983; Ong-Dean, 2006; Sleeter, 2010).[21]

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[19] Samuel Kirk worked at the Wayne County Training Center (WCTC) in the 1930s, while a doctoral student at the University of Michigan. The WCTC was a school where Strauss and his team researched the effects of brain injury on behavior and learning difficulties. Recall that Strauss coined the term minimal brain damage to refer to children with learning difficulties that were not caused by intellectual disabilities or emotional problems.

[20] The quoted text appears in an article in a 1962 issue of Exceptional Children. A similar definition appeared in the first edition of his textbook *Educating Exceptional Children*, published the same year. The term was also used in his 1963 speech to parents, teachers, and other professionals at the meeting organized by the Fund for the Perceptually Handicapped that would become the Association for Children with Learning Disabilities and, ultimately, the the Learning Disabilities Association of America.

[21] During the late 1960s and early 1970s, minority groups pressured schools to discard the notion of cultural deprivation and stop classifying disproportionate numbers of minority children as mentally retarded.

Although Kirk's definition made passing reference to a "possible cerebral dysfunction," it soon became clear that the purpose of the label was to remove any emphasis on neurological impairment. The presumed organic cause was attractive to parents because it suggested a cure and removed attention from the cultural integrity of the home; however, any emphasis on proof of organicity was seen as an obstacle to the success of a functional label. Because it confronted medical jurisdiction directly, the category was wholly unacceptable to the proponents of medical labels. The absence of medical jurisdiction had consequences: it meant that groups that were excluded from the definition of learning disabilities would be able to challenge the exclusion in the political arena without confronting the "expert" clout of medicine. The second task force convened by the U.S. Department of Health, Education and Welfare (discussed above), which was comprised primarily of educators, adopted the term "learning disabilities" rather than "minimal brain dysfunction," explaining that the latter label "failed to communicate accurately" and ignored "the responsibility of the school toward children with learning problems ... regardless of the etiology" (Haring, 1970, p. 21). The task force buttressed its conclusion by conducting a survey of school administrators, which showed that about half of the students currently in "special" classes had a diagnosed neurological impairment.

The task force was united in its rejection of medical approaches, but beyond that was not able to agree on a single definition of learning disabilities, which foreshadowed decades of definitional disputes. Instead the task force referred to two definitions – one based on differences in perceptual-motor function and another based on discrepancies between academic potential and actual functioning or achievement. The National Advisory Committee on Handicapped Children (NACHC) to the Bureau of Education for the Handicapped within the U.S. Office of Education, headed by Samuel Kirk, issued its first report on January 31, 1968, which included a definition of learning disabilities that was similar to Kirk's

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Many students who previously were or would have been classified as retarded, slow, or culturally deprived were classified as learning disabled (Sleeter, 1986).

1962 definition, except that it narrowed the category by dropping emotional disturbance as a potential cause of a learning disability (meaning that the definition excluded children whose learning differences were best attributed to emotional disturbances). The learning disability label was created as a discrete category to describe academic problems, particularly under-achievement, that resulted from specific deficits (although it was not at all clear what this meant from a neurological perspective) (Kavale and Forness, 1998, p. 245).

Within the learning disabilities field, inattention was seen as a learning problem, but it was not clear whether inattention arose from a processing deficit. Learning disabilities might precede attentional problems (where students develop inattentive behaviors because of repeated failures), or attention problems might precede learning disabilities (where inattention results in the student failing to process important academic instruction). It was also possible that attention problems and learning disabilities were separate conditions that co-occur for some group of children (Pennington et al., 1993). As unlikely as this might seem from an etiological standpoint, this is now the primary understanding of the two disorders and helps to explain the high rates of comorbidity.

1.2.2.3 The First Epidemic

Although medicalization points to an epidemic starting with the expansion of medical jurisdiction and shifting to increased pharmaceutical industry spending in the late 1990s (Conrad, 2005), the current "epidemic" in fact was not the first one. There was an earlier epidemic in the 1960s that grew out of shifts in the field of psychiatry (Freeman, 1976), which inhibited for a while the widespread use of medications with children. Medicalization, itself, cannot explain the discontinuity.

From the end of World War II to the mid 1960s, psychodynamically-oriented psychiatry was a prestigious field; however, by the mid 1960s, the prestige of the field was diminished due to competition from practitioners and challenges to the legitimacy of the field. One group that had tremendous influence in the popular culture came from academia

(Mayes and Horwitz, 2005); academic critics questioned the validity of the concept of mental illness (Szasz, 1974; Scheff, 1999). Chapter 2 contains an extended discussion of the medicalization critique that grew out of this broader attack. The passage of Medicare and Medicaid legislation in 1965, which increased the importance of third-party payments, placed insurance companies in a position to reject the economic justification for the psychodynamic approach, primarily because it did not utilize a categorical disease model (Mayes and Horwitz, 2005). Finally, deinstitutionalization exacerbated the situation by changing psychiatry's core constituency (from inpatient to outpatient) and placing more importance on pharmacological solutions (Eyal et al., 2010; Mayes and Horwitz, 2005).

Psychiatric views about ADHD were not immune to these challenges. Among the threats that psychiatry faced was an anti-Ritalin movement that pointed to the numbers of school children that were thought to be using stimulant drugs. A 1970 Washington Post story erroneously claimed that 5 to 10 percent of all school children in Omaha, Nebraska were receiving stimulants (Maynard, 1970). The story created a controversy around the use of stimulants, because it implied that parents were being coerced into medicating their children (a la Wender); this concern was the subject of congressional hearings, conferences, and books (Lenz, 2005).[22] A number of books popularized arguments that hyperactivity was not a real diagnosis, that it was created by drug companies to make money, or that it was caused by food allergies and food additives (Schrag and Divosky, 1976; Feingold, 1976, 1975). A prominent book – *Crisis in the Classroom* by Charles Silberman – argued that schools actually cause academic failure by imposing discipline and academic standards that render children docile.

The growing acceptance of stimulant drug treatments that started in the 1960s receded in the 1970s, as these negative reports surfaced (Ross and Ross, 1976; Sroufe and Stewart, 1973). Some psychiatrists began to break ranks and urge critical appraisal in light of the

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[22] Federal Involvement in the Use of Behavior Modification Drugs on Grammar School Children of the Right to Privacy Inquiry: Hearing Before the Spec. Studies Subcomm. of the H. Comm. on Gov't Operations, 91st Cong. (1970).

lack of evidence of long-term benefits from stimulant drug use (Sroufe and Stewart, 1973; Sprague and Werry, 1971). A noteworthy dialogue in the *New York Review of Books* revealed disagreement among experts as to the disorder (Douglas, 1970; Carrillo, 1970; Holt, 1970; Yanow, 1970). John Holt – an educator and staunch advocate for the perspective that schools were *causing* academic failure – referred to the disorder as "fashionable quackery which blames on the nervous symptoms of children the stupidities and inhumanities of our schools," while Canadian psychologist Virginia Douglas took the mainstream position that "stimulants ... can produce significant improvement on a variety of behavioral and cognitive measures." Ultimately, confidence in a pharmaceutical solution waned for four related reasons: the ill-defined boundaries of the three categories (MBD, LD, and hyperactivity), concerns about the number of children thought to be using stimulant drugs, the perspective that schools were promoting drugs to render the students docile, and the lack of evidence of the long-term effects of the drugs (Freeman, 1976). The question, then, is what macro conditions changed so that a second "epidemic" could occur. The medicalization perspective points to pharmaceutical advertising in the 1990s, but I argue below that the pharmaceutical "engine" is only a partial story. The pivotal factor was the shift in the 1980s to thinking of attention as the core symptom and the resulting cognitive interpretation of the disorder.

1.2.2.4 Triumph of Behavioral Diagnosis

Formation of New Communities Part of the explanation lies in the construction of learning disabilities as an educational disorder with little to no emphasis on neurological issues, which relegated the symptoms of inattention, hyperactivity, and poor impulse control to the periphery of the new educational category without relinquishing jurisdiction over them entirely. In the 1970s, amidst the negative public response to the use of stimulant drugs in children, advocates of the learning disabilities label mobilized in the political arena, which led to the legislative recognition of disability rights for children with minor learning impairments. With a political goal to limit prevalence, advocates placed a primary emphasis on demonstrable weaknesses in particular school subjects relative to others. That limitation had several additional advantages. It was in the purview of educators. It promised a greater return to targeted intervention than a focus on "slow learners" would have done. And it allowed enrollment to be targeted to the white middle-class children whose lack of success in the classroom could not be otherwise explained (Carrier, 1983; Ong-Dean, 2006; Sleeter, 2010, 1986).

In the wake of the civil rights legislation and the rights-based conception of disability, Congress enacted Public Law 94-142, the Education for All Handicapped Children Act of 1975.[23] The broader context of this legislation is discussed in Chapter 4, but, for current purposes, this law is significant because – due to significant lobbying by the new learning disabilities advocacy groups – it gave "specific learning disabilities" (SLD) official status as a category eligible for funding. It remained unclear how learning disabilities would be defined (and specifically whether the category would include children with symptoms of either inattention or hyperactivity). Some, but not all, states had defined learning disabilities to include deficits in attentiveness.[24]

To put these developments in context, a statutory predecessor, the Education of the Handicapped Act,[25] defined learning disabilities as:

> a disorder in one or more of the *basic psychological processes* involved in understanding or in using language, spoken or written, which disorder may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations. Such disorders include such conditions as perceptual handicaps, brain injury, *minimal brain dysfunction*, dyslexia, and developmental aphasis. Such term does not include children who have learning

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[23] As discussed in Chapter 4, Congress previously had addressed the problem of educating the handicapped in 1966 when it amended the Elementary and Secondary Education Act of 1965 to establish a grant program to assist states in the education of handicapped children.

[24] Mercer et al. (1976, 1985, 1996) track the definitions of learning disabilities used by States over time. As part of a process of gradually moving towards the discrepancy standard, states began to remove attention and other process-oriented difficulties from their definitions and criteria. As of 1983, 8 states included attention in their LD definitions or criteria (Mercer et al., 1985).

[25] Public Law 91-230, April 13, 1970, 84 Stat. 175 (modifying a grant program established in 1966).

> problems which are primarily the result of visual, hearing, or motor handicaps, of mental retardation, of emotional disturbance, or of environmental disadvantage (emphasis added).

The new federal statute was not explicit about how states and local school systems were to identify students as having "specific learning disabilities," but was accompanied by a mandate to the Bureau of Education for the Handicapped in the federal Department of Education (the predecessor of the Office of Special Education Programs) to establish classification criteria for SLD that would provide guidance to states.[26] Due to concerns about potentially uncontrolled SLD prevalence, Congress established a temporary cap at 2% of the population as part of the 1975 statute, pending the development of regulations that would establish specific classification criteria for SLD.[27]

The proposed criteria published in the Federal Register took an almost exclusively non-organic approach, defining a specific learning disability as a "severe discrepancy" between academic achievement and intellectual ability, with "severe discrepancy" being further defined as "achievement in one or more of the areas fall[ing] at or below 50% of the child's expected achievement level, when age and previous educational experiences are taken into account" (Federal Register, Nov. 29, 1976, 41:52405). Although the federal statute referred to disorders in "basic psychological processes," no mention of processing deficiencies appeared in the proposed SLD regulations or in the revisions eventually adopted. The state of research in the early to mid-1970s was thought to preclude using processing deficits as the basis for classification criteria (Hammill and Larsen, 1978, 1974). Existing ways to measure neurological processing were deemed inadequate in terms of norms, reliability, and validity. Moreover, processing deficits were difficult to change through remedial activities and, changes in processing competencies did not clearly translate into

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[26] Public Law 94-198, November 29, 1975, 89 Stat. 777, 794; Federal Register, Nov. 29, 1976.

[27] Recall that earlier state- and local-funded programs faced severe budget constraints (Lazerson, 1983). As a result, the congressional allocation formula specified that no more than 12 percent of the children aged 5 through 17 could be considered handicapped and no more than one-sixth of the children eligible to be considered handicapped could be children with specific learning disabilities. Federal Register, Nov. 29, 1976, 41:52401.

improved academic performance in relevant domains such as reading, mathematics, and written expression. In short, whatever their theoretical or medical import, educators did not want to use processing deficits as a defining principle.

Relatively little discussion of the discrepancy criterion itself occurred at this time. Most of the letters and presenters at public hearings were concerned with the formula for establishing a severe discrepancy (Federal Register, Dec. 29, 1977, 42:65083-85). The concerns related both to the use of a quantitative measure and to the psychometric adequacy of the measure. Based on comments on the proposed regulations, the 50 percent figure for determining "severe discrepancy" was removed. Although some states had defined SLD to include attention disorders, the delineation of attention disorders and other learning disorders never became a hot-button issue for those that lobbied regulators. In fact, SLD was seen as a final common pathway of many things, including "legitimate" cases of attention problems. According to the regulatory history, "hyperactivity, distractibility, attention problems, concept association problem, etc." were "symptoms;" "[t]he end result of the effects of these symptoms is a severe discrepancy between achievement and ability."[28] The final SLD classification criteria were published just before the Congressional deadline, averting the necessity for a 2% cap (34 C.F.R. 300.540-544).

A consensus on the best method to measure the discrepancy and the criteria for what constituted "severe" has never been achieved. The criticism of the ability-achievement discrepancy was that it did not establish a group of students with unique needs (Fletcher et al., 2003). Most obviously, poor readers with IQs commensurate with their reading levels and poor readers with higher IQs have similar needs and respond to the same kind of instruction with comparable results. In other words, there was an enormous emphasis on "potential" embedded in the definition (the significance of which is discussed in Chapter

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[28] The Interagency Committee that was charged with developing a definition of learning disabilities recommended a definition that would exclude learning problems that were a "direct result" of socioenvironmental influences, emotional disturbances, mental retardation, or attention disorders. Because other aspects of that definition became problematic, the regulatory separation of learning disabilities and attention disorders never occurred.

4). Moreover, the focus on discrepancy tended to delay treatment to later grades when the child was farther behind peers and effective interventions were more difficult to implement. Accepting those criticisms, when Congress reauthorized IDEA in 2004, it rejected the approach of the earlier regulations. Section 1414(b) of the statute now says that schools will "not be required to take into consideration whether a child has a severe discrepancy between achievement and intellectual ability." Implementing regulations went into effect in 2006, which require states to permit local school districts to use any program that is based on a child's response to a research-based intervention (RTI) if the child does not achieve adequately for his or her age or meet grade-level achievement standards (34 C.F.R. 300.307, 300.309). Most states have elected to permit students to establish eligibility using either the RTI or the severe discrepancy tests (Zirkel, 2010). This means that an RTI that targeted inattention (or another process-related deficiency) arguably would be sufficient to establish a learning disability if it successfully improved achievement.

In the end, hyperactivity and MBD were separated from learning disabilities both because medical experts believed that stimulant drugs acted on behavioral symptoms more than on cognitive domains (Conners, 2000) and because educators and advocates wanted to define learning disabilities narrowly so that prevalence would be controlled. As three educational psychologists explain:

> a major step in the development of identification methods for LD was the dropping of the even broader concepts such as minimal brain dysfunction (MBD) and the recognition that MBD consisted of at least two groups of children: those with difficulties primarily in the academic domain (LD) and those with difficulties primarily in the behavioral domain (ADHD).

(Fletcher et al., 2003, p. 35). A further complication was that inattention was seen as a processing deficit; the rejection of a process-oriented definition of learning disabilities interfered with the incorporation of inattention under the LD umbrella. All in all, the politicization of learning disabilities – or, we could say, the de-medical approach[29] – allowed

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[29] One of the major learning disabilities organizations – the Learning Disabilities Association of America

learning disabilities advocates to progress in the political domain well ahead of the medical experts who were seeking to establish validity of the clinical constructs MBD and hyperactivity; as explained in the next section, a successful diagnostic category would not emerge until 1980. From the perspective of educators, inattention had a fairly insignificant position within the learning disabilities umbrella.[30]

Debates about Core Symptoms In the aftermath of the negative public response to the use of stimulant drugs and the relegation of attention disorders to the fringe of the learning disabilities movement, how did the category emerge and reach its present level of success? Medical imperialism alone does not supply an answer because the medical profession had weakened considerably. One contributing factor was the carveout of perceptual difficulties from learning disabilities, which left a gaping hole for attention disorders to emerge. More fundamentally, the resolution of the etiological-functional dispute through the rise of biological psychiatry provided legitimacy for a new diagnostic category. As a result, rating scales were refined and sanctioned, which provided optimism that drug treatments would be given to the right children. Most importantly, the scientization of the category gave parents a reason to "buy in" because it ushered in new understandings of what symptoms were "core."

Following the Ritalin scare in the 1960s and 1970s, the research community was in conflict – about the boundaries of categories, the measurement of symptoms and the utility of diagnostic tools, and the alleged excesses in the use of stimulant drugs to treat target symptoms. The psychiatrists that promoted the MBD label remained primarily interested in etiology; Wender (1971) was among the first to advance the hypotheses that the disorder was genetic in origin and was mediated by decreased activity in dopaminergic

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– now considers learning disabilities to be neurologically based processing problems. See their web site, http://ldaamerica.org/types-of-learning-disabilities/.

[30] This point becomes clear when ADHD advocates begin to argue for incorporation into the IDEA. At that time, educators argue that the symptoms are better handled within the confines of the learning disabilities category (See Chapter 4).

systems in the brain. Laufer and the other psychiatrists that promoted the hyperactivity label remained primarily interested in building upon Bradley's drug research using technologies that depended on correlations between the users that were effected by the stimulants and abnormal EEG responses. Laufer and Denhoff (1957) believed that hyperactivity was caused by trauma and not genetics and also felt that the symptoms of hyperactivity were outgrown. It is a safe assumption that parents did not push for either label at this juncture because neither category was linked to unexplained academic failure.

The contemporary definition of an attention disorder emerged from the interplay of different forms of medical knowledge. Starting in the 1970s and continuing to present, new groups of experts began to revisit (and ultimately engaged in substantial debates) about the core symptoms of the disorder. Much of this research was performed not by medical experts, but by psychologists that moved in as medicine proper became less dominant. There was a huge increase in publications concerned with attention beginning in 1970s. Psychologists including Michael Posner, Donald Broadbent, Alan Baddeley, Joseph Sergeant, and others make headway with cognitive studies of attention and, in particular, with the study of different aspects of attention, including information processing models of selective attention, investigations of divided attention, interest in sustained attention, and observations of impaired cognitive skills in neurological patients (Cornish and Wilding, 2010). Much of this research focused on performance enhancement – of soldiers, air traffic controllers, etc. – rather than study of brain-injured individuals (Cornish and Wilding, 2010). Even the way that the research viewed attentiveness deficits shifted from behavioral (disorganization, forgetfulness, distractibility, poor concentration) to cognitive (differentiating irrelevant information from relevant, switching focus, etc.)

Also significant were the growing threats that psychiatry faced, leading to the gradual adoption of a symptom-based, categorical orientation that privileged functional symptoms over "medical" causes across the board (Mayes and Horwitz, 2005; Smith, 2008). The publication of DSM-III in 1980 "triggered a paradigm shift in how society came to view mental health" (Mayes and Horwitz, 2005, at 265). A symptom-based approach was adopted across-the-board to replace the psychodynamic approach used in DSM-I and DSM-II. With the DSM-III, psychiatrists gradually began to address the symptoms of mental illness with drugs rather than psychotherapy.[31] There was a perception that diagnostic reliability was needed before substantial empirical research could proceed (First, 2010; Mayes and Horwitz, 2005; McBurnett and Lahey, 1993). Further, insurance companies and the government were reluctant to provide reimbursement without a more objective demonstration of the utility of treatment. DSM-III thus motivated private investment in new drugs by aligning the incentives of clinicians, insurers, the government, and pharmaceutical companies (Mayes and Horwitz, 2005), which meant that the NIMH would no longer be the only substantial investor in pediatric psychopharmacology.

The DSM-III categories remained theory-neutral in regards to etiology, focusing instead on symptom manifestation. Within the new framework, DSM-III separated hyperkinetic reaction (the DSM-II label) into three behavioral disorders – attention deficit disorder, oppositional defiant disorder, and conduct disorder – appearing under the heading "disorders usually first evident in infancy, childhood, or adolescence" and the subheading "behavioral."[32] With the new work on attention coming from different medical disciplines, the predominant clinical focus on hyperactivity shifted toward an emphasis on attention problems. In a paper addressed to the Canadian Psychological Association, Virginia Douglas (1972, p. 260) (see also Douglas and Peters, 1979) argued "that the inability of these children to sustain attention and to keep impulsive responding under control may be even more important symptoms" than hyperactivity. She suggested that a short attention span might contribute to the impression of excessive activity and pointed out that recent stud-

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[31] Largely influenced by Freud, American psychiatrists during the first half of the twentieth century used psychoanalytic approaches that attributed psychiatric problems to familial and environmental effects for nearly all clinically-referred children in the United States (Leffers, 1997, pp. 90-93). The application of behavioral and cognitive-behavioral interventions to children identified as hyperactive began in the 1960s and became more widespread during the 1970s.

[32] The word "learning" was not used in DSM-III, but disorders of reading, arithmetic, language, and articulation were categorized in DSM-III as "specific developmental disorders."

ies indicated that stimulant treatments seemed to exert their "main effect by helping the hyperactive child sustain attention and control impulsivity" (Douglas, 1972, p. 271). Douglas' paper was influential at the time and provoked further research on the issue and ultimately initiated a change in the conceptualization of the disorder (Barkley, 2005), leading to the construction of a disorder that reflected (and continues to reflect) an uneasy association of behavioral and cognitive symptoms. DSM-III took the position that hyperactivity was no longer an essential diagnostic criterion for the disorder and that the syndrome occurred in two types "with or without hyperactivity" (Conners, 2000). The symptoms thus were grouped into two subtypes for inattention and hyperactivity-impulsivity; the criteria for each subcategory were listed separately to suggest that these characteristics had equal import. The primacy of the inattention symptom benefited from the understanding that "when [hyperactive children] grow older they become less active but attentional problems and impulsivity problems remain" (Douglas, 1972, p. 275).

To improve the criteria with respect to then-current empirical validation, the revision of the third edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R) in 1987 removed the concept of two subtypes and renamed the disorder "Attention Deficit-Hyperactivity Disorder (ADHD)." The symptoms of inattention, impulsivity, and hyperactivity were combined into a single list of symptoms with a single cutoff score set at 8 symptoms (McBurnett and Lahey, 1993). The symptoms were empirically derived by rating scales and a field trial (Conners, 2000). The subtype "ADD without hyperactivity" was removed and assigned to a residual category named "undifferentiated ADD." DSM-III-R retained "specific developmental disorders," but as a subgroup of "developmental disorders," the other two subgroups being mental retardation and pervasive developmental disorders. DSM-III-R should have had no significant effect on ADHD prevalence.

1.2.2.5 Response Inhibition Model and Adult ADHD

Modern Research Trends In the 1990s, three significant but related research developments appeared to have enormous influence on the expert medical understanding of the disorder, which allowed a coalition to build in support of the diagnosis. One development related to advances in neuroimaging techniques, contributing to the re-invigoration of the idea that frontal lobe impairment is responsible for ADHD symptoms. Although the EEG allowed researchers to detect electrical activity in the brain, new neuroimaging techniques allowed a visual study of the developmental course of the normal brain (Casey et al., 2008) and enabled research into many areas of the brain that are thought to be affected in individuals with ADHD. Using MRIs, researchers found evidence that the prefrontal and frontal lobes, basal ganglia, and cerebellum are smaller in individuals with ADHD (Castellanos and Tannock, 2002; Castellanos et al., 2002; Zametkin et al., 1990). In addition, PET scans provided evidence of reduced blood flow in the frontal lobes and basal ganglia in persons with ADHD. Dumit (2000) points out that the applicability of this brain scan research to understanding psychiatric disorders was contested within the larger research community. However, he argues that this *preliminary* brain scan research became central to decision-making about ADHD, supplying "a 'gold standard' of demonstrative proof of neurobiological involvement" (Dumit, 2000, p. 222).

Evidence of genetic heritability of ADHD also made an important contribution to the process of diagnostic expansion. Adoption, twin, and family studies established a strong genetic etiology for ADHD (Barkley and Lombroso, 2000; Biederman et al., 1990; Cornish and Wilding, 2010; Kieling et al., 2008; Sandberg and Barton, 2002; Sharp et al., 2009; Waldman and Gizer, 2006). In a review of twin studies dating back to the early 1970s, Faraone et al. (2005) found an average heritability rate of 76 percent. Researchers agreed, however, that environmental risk factors and potential gene and environment interactions also increase the risk for the disorder (Banerjee et al., 2007). The accumulating genetic evidence also revealed that the disorder was more heterogeneous than previously thought

(Kuntsi et al., 2014; Willcutt et al., 2010), both in terms of clinical presentation but also in terms of etiologic bases. Although there is no direct mapping of genes on a given chromosome to phenotypes, researchers attempted to establish susceptibility genes that contribute to the ADHD phenotype (Castellanos and Tannock, 2002; Kieling et al., 2008). Numerous molecular genetic studies of association and linkage between attention issues and a variety of candidate genes have been conducted during the past 15 years; the majority of the candidate genes studied underlie various facets of the dopamine, norepinephrine, and serotonin neurotransmitter systems, although the etiological role of candidate genes outside of neurotransmitter systems have also been examined (Cornish and Wilding, 2010; Waldman and Gizer, 2006).[33] There is no clear consensus across studies of different candidate genes and their relationships to ADHD (Stevenson et al., 2005; Cornish and Wilding, 2010). Yet, as in the case of autism spectrum disorders (Liu et al., 2010), overstating the importance of the heritability estimates has allowed researchers to build the case that ADHD is a genetically-transmitted disorder (Wender, 1997).

The third research development – and perhaps the most significant – was the marked increase in neuroscience studies of executive functions (Castellanos, 1997; Jurado and Rosselli, 2007; Pennington and Ozonoff, 1996), which helped to stabilize the behavioral-cognitive association and to resurrect the possibility of ADHD as a form of learning problem. Building on cognitive psychology research on attention,[34] executive functions describe all of the tasks – coordinated in the frontal lobe – that relate to the management of cognitive processes. These tasks include time management, attention, planning and organizing, remem-

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[33] For the most part, attention issues are treated as symptoms of genetic disorders, such that genetic mutations are not really seen as candidate loci for ADHD. The relationship between geneticization and the genetic makeup of populations can be complex, as others have observed. In the case of autism, for example, "geneticization" played an important role in diagnostic expansion, and expansion, in turn, contributed to the genetic heterogeneity now associated with autism (Navon and Eyal, 2016, 2014). Unlike the case of Fragile X and autism, I have found little evidence of any constituency attempting to link the genetic disorders associated with attention problems to ADHD (perhaps because its validity is so heavily contested).

[34] The executive function literature builds on Broadbent's (1958) "selective attention," Baddeley's (1992) "working memory," and Posner's (1990) "cognitive control," among others.

bering details, curbing inappropriate behaviors, and problem solving (Jurado and Rosselli, 2007; Pennington and Ozonoff, 1996). Executive functions are now associated with explanations for learning disabilities, ADHD, and other developmental disorders. Of importance here, the executive function literature became a catalyst for another shift in conceptions about the core symptoms of the disorder. The core symptom debate reached its apex in the early 1990s when Russell Barkley (1997b; 1994) – a clinical psychologist who became a key advocate for the validity of the disorder – proposed a "unifying theory" of ADHD in which response inhibition is the "central impairment" (1994, p. 13).[35] Barkley concluded that persons with ADHD have difficulties with executive functions served by the prefrontal lobes that flow from the capacity for delayed response (including working memory, inner speech, and self-regulation of emotions); Barkley compared his theory to the Still postulate that similar symptoms stemmed from a defect in "moral control" (Barkley, 1994, p. 13):

> Within the past decade a number of findings from various laboratories using diverse methodologies have converged on a common conclusion akin to Still's. The central impairment in ADHD relative to other psychopathologies in children is one of response inhibition or behavioral impulsivity.

Acknowledging that other researchers had made similar assertions, he claimed to be the first to "explain just how such a deficit leads to the diverse impairments" associated with ADHD (Barkley, 1994, p. 19). He proposed to jettison the inattentive type of ADHD, concerned that it and the hyperactivity-impulsivity or combined types actually are separate disorders (Barkley, 1997b). Other researchers disagreed, retaining the belief that weakness in attentional control is the core impairment (Cornish and Wilding, 2010). For those researchers, poor inhibition should not be seen as a "definitional" because it occurs in many other behavioral disorders (Sergeant et al., 2002).

Barkley's views were influential but not dispositive in the drafting of DSM-IV. Dissatisfied with the single list of symptoms in DSM-III-TR, drafters relied on factor analyses that suggested a two-factor solution, with hyperactivity-impulsivity and inattentiveness as

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[35] Barkley is the researcher who compared ADHD science to the "laws of gravity," as discussed above.

separate subgroups. The number of symptoms necessary for a diagnosis under either subgroup was set arbitrarily, in an (unsuccessful) effort to control prevalence (Lakoff, 2000; McBurnett and Lahey, 1993). The impairment criterion was added, and the diagnostic category was placed in the group of Attention Deficit and Disruptive Behavior Disorders, reflecting Barkley's behavioral inhibition thesis. DSM-IV also renamed developmental disorders as "disorders usually first diagnosed in infancy, childhood, or adolescence"; the word "specific" vanished from all levels of classification and learning disorders was reinstated as a main subgroup alongside motor skills disorder and communication disorders. There were no material changes to the diagnostic category in the DSM-IVR in 2000, so from 1994 to 2013, ADHD was considered a behavioral disorder (consistent with Barkley's response inhibition model), although the inattentiveness subgroup was not dropped entirely.

Although the changes purported to be minor, DSM-5 moved a significant step away from the response inhibition model of ADHD towards a cognitive understanding of the disorder. A set of studies published after 1994 renewed support for a two-dimensional syndrome (inattention and hyperactivity/impulsivity) by examining predicted types of comorbidity associated with each dimension; the first dimension is associated with learning problems, and the second with oppositional and conduct problems (Frick and Nigg, 2012).[36] As a result of this work, the drafters of DSM-5 changed the clustering of disorders within subchapters. According to work group members (Frick and Nigg, 2012, p. 85), "on balance, ADHD is best thought of as a neurodevelopmental condition rather than primarily or solely a behavioral condition." Thus, both ADHD and LD are clustered within "Neurodevelopmental Disorders." This separates ADHD conceptually from oppositional defiant disorder and conduct disorder (which are now clustered under the heading "Disruptive, Impulse Control, and Conduct Disorders") and reunites it with learning disabilities (which

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[36] Earlier work exploring an empirical meta-structure of DSM disorders that juxtaposed externalizing and internalizing dimensions excluded learning disorders, autism spectrum disorders, motor disorders, and language disorders. Newer studies that find that ADHD clusters with autistic symptoms, motor coordination, and reading problems have undermined the association of ADHD with behavioral disorders. (See generally Frick and Nigg, 2012).

also have begun to be seen as deficiencies in executive function) (Tannock, 2013; Kupfer et al., 2013). There remains considerable disagreement about whether ADHD can be broken into subtypes that share phenotype commonalities. Derefinko et al. (2008) reported different cognitive and behavioral styles between children with the inattentive subtype and the combined subtype, the former was characterized by a cognitive sluggish tempo. Consistent with Barkley's earlier reasoning, sluggish cognitive tempo is now seen by some as a new disorder or a new dimension of ADHD (Lee et al., 2014; Moruzzi et al., 2014; Schwarz, 2014; Watabe et al., 2014). Conceptions of the disorder as behavioral or cognitive continue to evolve, and I would argue that the cluster research says less about the shifting nomenclature than the related effort to extend the category to reach adults – which was thought to be necessary because medical specialists already were making these diagnoses.

An ADHD Community Forms Although the brain imaging research was formative and contested as applied, the genetic research was inconclusive, and the executive function literature was theoretical, those three research trends were significant to the formation of a coalition in support of the ADHD label in the late 1980s. A factor of similar import, however, was the ramp-up of special education programs for relatively high-functioning children with mild learning disabilities.[37] The primary parent advocacy group, Children and Adults with Attention-Deficit/Hyperactivity Disorder (CHADD), was formed in 1987, in southern Florida, when two parents (a homemaker and a speech pathologist) organized a meeting with clinical psychologist Harvey Parker to provide information to people in the local community about ADHD (Chandler, 1987; Doto, 1987; Hulse, 1993; Lade, 1987; Saslow, 1991; Vigoda, 1991; Wood, 1988).[38] The organization expanded – first statewide and then nationally – within just a few years. The staff and board of advisors is composed of psychiatrists, psychologists, educators, and lawyers, many of whom are parents of chil-

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[37] The largest growth in the number of students served with specific learning disabilities occurred in the late 1970s and 1980s (U.S. Department of Education, 2013).

[38] The Journal of Attention Disorders was first published in 1996, trailing the formation of parent advocacy groups by almost 10 years.

dren with ADHD or identify as having ADHD themselves. Beyond providing information to parents and thus reducing doubt about the legitimacy of the disorder (Barker, 2011; Rabeharisoa, 2006), a primary aim of the group is to lobby the federal and state governments on issues pertaining to ADHD. Near the time of its formation, the group became heavily involved in lobbying Congress to provide special education services to students with ADHD – an effort that was partially successful; ADHD was recognized in departmental regulations but not in the federal statute. CHADD has adopted a medical understanding or interpretation of the disorder. Its website refers to ADHD as a neurobiological disorder, and it promotes multimodal treatments – meaning stimulant and non-stimulant drugs, along with behavioral intervention strategies, and educational programs and accommodations.[39] CHADD has been criticized heavily for accepting funding from pharmaceutical companies (about one-third of its overall funding) (Schwarz, 2013b).

The state of research and the new advocacy groups spawned a new market for adult testimonies and self-help books. The idea that adults can have ADHD had appeared in clinical papers for some time, but only became popularized in the 1990s (Barkley et al., 2010). Studies that followed children with the disorder into adolescence and adulthood found that the impulsivity and inattentive symptoms persisted over time, even if the hyperactivity symptoms receded. The new conception of executive dysfunction allowed the disorder to be conceived as a disorder of the cognitive management system rather than a behavioral disorder of childhood.

This is an important part of the process of looping, because adults began to work to persuade others about the reality and seriousness of the disorder and the usefulness of

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[39] Advocacy groups differ not just based on the network of expertise that they can build upon but also on their contributions to that network. Edwards et al. (2014), for example, compares parent advocacy groups in Ireland and France. Although groups in both countries (as in the United States) aim to augment parental understanding of what ADHD is and how it can be managed, the differences between the groups relate to the acceptance of a multiplicity of epistemic practices. In Ireland, as in the United States, ADHD is seen as a neurobiological disorder, and treatment options are focused on individual-level responses that have scientific validity in the research community, while in France, ADHD is not reduced to a neurobiological disorder, and treatments options consider the individual child and the environment.

medication. For example, Time Magazine ran a cover story in July 1994 on adult ADHD. The cover photo displayed a disheveled adult male wearing a suit and tie and including the caption "Disorganized? Distracted? Discombobulated? Doctors Say You May Have ATTENTION DEFICIT DISORDER. It's not just kids who suffer from it." The same issue included a review of *Hail to the Hyperactive*, a book that argued that characteristics associated with ADHD like impulsiveness, high energy, and risk taking are highly represented in the U.S. gene pool. Parents increasingly began to recognize ADHD symptoms in themselves and separate parent groups grew out of the CHADD meetings. Several prominent psychiatrists used the popular press to promote stimulant treatments for ADHD as a panacea for distracted, impulsive youth. Edward Hallowell (1994, pp. 24, 48, 82, 295)'s best-selling book *Driven to Distraction* used a prosthetic metaphor, comparing medication to "a pair of eyeglasses, helping the individual to focus." He offered an account of the symptoms with which many adults could identify: "So many adults with ADD have piles, little mess-piles, big mess-piles, piles everywhere. They are like a by-product of the brain's work" Hallowell (1994, p. 98). And more: "People with ADD also love cars. ADD loves movement. Many adults with ADD report that their best thinking is done while driving. And people with ADD love big cities" (Hallowell, 1994, p. 98). In a 2005 sequel, *Delivered from Distraction,* Hallowell and Ratey (2005, xxiii) moved even further towards a performance-enhancing rhetoric: "If you don't get help, ADD can curse you and make you wretched. But if you work it right, ADD can enhance your life and make you sparkle."[40] The diagnosis offered the benefit of allowing adults "to reframe the past in a more positive and realistic light" (Murphy and Levert, 1995, p. 104). Indeed, based on interviews conducted at several evaluation sites, Leffers (1997) argues that the popularity of the category and all it entailed was sufficient to motivate many adults actively to seek a medical diagnosis. Murphy and Levert (1995) explain the role of ADHD therapy for adults as empow-

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[40] The prosthetic metaphor made less sense once it became clear that stimulant drugs could increase attention for all who took them (Leffers, 1997).

ering. Therapy aims to “help patients fully understand the disorder and how it manifests itself in their lives” so that “adults can chang[e] the behaviors or circumstances [they] dislike and enhanc[e] [their] strengths and assets” (Murphy and Levert, 1995, p. 104). Therapy also involves letting others know about the disorder and its effects, which allows affected adults to “repair[] any past damage” and to “pav[e] the way to a more stable, fruitful future” (Murphy and Levert, 1995, p. 104). Thus, more than the cluster research described above, popular support for a cognitive interpretation of the disorder, consistent with adult symptoms – many of whose behavioral symptoms had subsided – led to a reinterpretation of the disorder from behavioral to neurodevelopmental. As a consequence, the number of adults (particularly women) using stimulant drugs has risen rapidly, reversing the childhood and adolescent gender gap favoring males (Express Scripts, 2014).

Coalescing Around Pharmaceutical Treatment Research into the effects of stimulant drugs for children with ADHD symptoms began in earnest in the 1960s, and by the 1970s, drugs were being prescribed for non-institutionalized children of all social classes. At that time, most medical professionals considered stimulant drugs to be an effective treatment for children who manifested hyperactivity as a primary symptom (Kavale, 1982; Hinshaw et al., 1997; Richters et al., 1995), although drugs often were used alongside behavioral or cognitive-behavioral treatments. Consensus emerged, however, that despite the apparent short-term gains in behavior attributable to stimulant medications, few data from well-designed studies existed. The existing research did not address the effects of stimulant drugs compared to therapeutic approaches. It often measured improvement against subjective markers such as teacher responsiveness to children with drugs (Whalen et al., 1980). It produced little evidence linking drugs to improvement in learning or other functional domains (Swanson et al., 1991; Swanson and McBurnett, 1993). Most importantly, it did not track symptom alleviation over the longer term. The research community perceived that a longitudinal, multi-site study was needed (Hinshaw et al., 1997; Richters et al., 1995).

To address concerns with previous drug research, the National Institute of Mental Health and the Office of Special Education Programs in the Department of Education initiated a large-scale longitudinal study in 1992 and enrolled the first subjects in 1994 (Arnold et al., 1997; Hinshaw et al., 1997; Richters et al., 1995). The study considered the effectiveness of several interventions in treating children (7-9 years of age) with ADHD. Nearly 600 children with ADHD (only the combined subtype) were randomly assigned to four groups: a "community care" group (the control group, where children continued to receive whatever care they otherwise were receiving), a medication management group where stimulant medication was provided under close supervision (which consisted of initial titration followed by monthly visits), a psychosocial treatment group with school and home components,[41] and a combined medication management and psychosocial treatment group. The treatment was provided during a 14-month period, and the children were observed at periodic intervals for 15 years after study treatments ceased. According to interviews by New York Times staff with several of the researchers that worked on the study, "[t]he study was structured to emphasize the reduction of impulsivity and inattention symptoms, for which medication is designed to deliver quick results" (Schwarz, 2013a). For example, researchers initially used 14 outcome measures that relied heavily on parent and teacher ratings of symptoms, and even though the medication treatment was adjusted to the subject's response, the behavioral intervention was "one size fits all."

The study's primary paper, published in 1999, concluded that medication "was superior to behavioral treatment and to routine community care." Just as important was the conclusion that the combined, multimodal treatment "did not yield significantly greater benefits than medication" for the core symptoms (MTA Cooperative Group, 1999a, p. 1073). For most outcomes, children in the combined treatment and the medication man-

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[41] Psychosocial treatment included three components: direct behavioral treatment of the child, parent training, and school-based intervention, all of which were integrated and administered by a consulting behavioral therapist (Arnold et al., 1997).

agement groups showed significantly greater improvement than those given intensive psychosocial treatment and community care.[42] Combined and medication management treatments did not differ significantly on any direct comparisons, but for some outcomes combined treatment proved superior to intensive psychosocial treatment or community care while medication management did not. The takeaway was that medical management produced substantial improvement in symptoms (compared to community care and psychosocial treatments), but that the returns to the combined medication and psychosocial treatments were "modest" when compared to medication management alone (MTA Cooperative Group, 1999a, p. 1073).[43] Further analyses showed that psychosocial treatments were not likely to be cost effective in most cases (Foster et al., 2007; Jensen et al., 2005).[44]

Follow-up studies that re-analyzed the data came to somewhat different conclusions. For example, studies that accumulated the different outcomes into a single composite outcome measure provided greater support for the multimodal treatment. Swanson et al. (2001) found that the multimodal treatment produced about 12 percent more "successes" than the medication treatment. They also found that the inability to demonstrate statistically significant effects of psychosocial treatments over community care resulted from off-

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[42] Children who received the combined treatment did better than children in the community care or psychosocial treatment groups on these outcomes: parent- and teacher-reported inattention; parent-reported hyperactivity-impulsivity, oppositional/aggressive behaviors, and internalizing symptoms; and reading achievement. There were no significant differences in the effects of treatment assignment on classroom observation, math achievement, and other parent- and teacher-reported social and emotional behaviors. Combined management and medication did not differ significantly on direct comparisons, but in several instances combined management was superior to behavioral management and community care, while medication management was not (MTA Cooperative Group, 2004).

[43] The authors noted that the loss of power caused by Bonferonni corrections from the choice to use 19 primary outcome measures resulted in a high chance "of declaring effect sizes lower than 0.4 not statistically significant, even though some clinicians might regard such effects as clinically significant" (MTA Cooperative Group, 1999a, p. 1083).

[44] Jensen et al. (2005) quantified this point, finding that over the 14-month duration of the study, the per-child cost of medication management was least expensive, followed by intensive behavioral treatment, followed by these two treatments combined. Foster et al. (2007), in contrast, found that the preferred cost-effective treatment varies as a function of the child's comorbidity; for "pure" ADHD, medication management appears likely to be most cost-effective, while for some comorbid conditions, the most cost-effective choice (considering long-term ramifications) involves behavior therapy. Most recently, Page et al. (2016) finds that a cost-saving strategy would be to begin treatment for ADHD children with a low dose of behavior modification before moving to pharmacological solutions.

setting positive and negative effects, depending on the site at which the intervention occurred (meaning the quality of therapeutic or medical care can be a differentiating factor). Conners et al. (2001) found that the combined treatment was significantly better than medication alone (with a small effect size). They concluded that the study's primary paper "ha[s] been widely misinterpreted as showing that combined treatment is equivalent to medication alone and offers no advantages over medication alone" (Conners et al., 2001, p. 160). Other follow-up studies have highlighted the variability in effects, depending on the existence of comorbid conditions, changes in family discipline style during the intervention period, and the subject's socio-economic status (Hinshaw et al., 2015).

Moreover, when researchers followed up with the sample after the 14-month treatment period, they found that the effects of medication treatments had begun to dissipate. The initial advantage of medication reduced by half by the first follow-up evaluation, which was 10 months after the termination of treatment (MTA Cooperative Group, 2004). By the next follow-up, 22 months after the end of the treatment, there were no longer significant treatment group differences in symptoms (Jensen et al., 2007; Molina et al., 2007; Swanson et al., 2007). Despite the poor results, NIMH's press release announcing the results of the latter paper was titled "Improvement Following ADHD Treatment Sustained in Most Children," referring to the obvious conclusion that all children showed an improvement in symptoms regardless of the treatment group to which they had been assigned.[45] Later follow-up papers showed that, even controlling for continued medication use during the follow-up period, the initial treatment assignment did not predict the previously-used outcome measures 6 or 8 years later; nor did treatment group predict other outcomes including grades, arrests, and psychiatric hospitalizations (Molina et al., 2009).[46]

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[45] The press release is found at http://www.nimh.nih.gov/news/science-news/2007/improvement-following-adhd-treatment-sustained-in-most-children.shtml.

[46] There were some small but significant effects. Children who received the multimodal treatment had fewer school services (i.e. special education) at 6 years than children who received the psychosocial treatment alone. Similarly, children who in the psychosocial treatment group had significantly lower rates of having diagnoses of anxiety or depression than the children in the other groups. A secondary analysis showed children with behavioral and sociodemographic advantage, with the best response to any treat-

The evidence in support of pharmaceutical and psychosocial treatments and their combination remains mixed. There is some evidence that stimulant drugs normalize brain structure, as measured by MRI (Spencer et al., 2013). And hundreds of studies continue to identify short-term symptom improvements associated with the use of stimulant drugs (Faraone and Buitelaar, 2009; Greenhill et al., 2002; Paykina et al., 2007). Yet recent studies using observational data find little evidence of long-term benefits of medication on academic success (Currie et al., 2014).[47] It is not clear why the symptomatic improvements associated with drugs are associated with such small effects on long-term academic outcomes (Langberg and Becker, 2012). The inability of drugs that improve attention to produce long-term academic and social outcomes generally has been attributed to offsetting effects (Advokat and Scheithauer, 2013), dosage levels that are suboptimal for improving cognitive domains, or effects that are sufficiently small that they cannot be accurately measured. It is also possible that the claims about treatment success have kept children from developing other needed skills.

Behavioral therapy has become the second most commonly used intervention for ADHD, and many studies have documented its short-term effectiveness (Evans et al., 2014; Pelham et al., 1998; Pelham and Fabiano, 2008; Pelham et al., 2016). Yet Sonuga-Barke et al. (2013) finds no such support, and other longer-term trials have raised questions about the effectiveness whether psychosocial treatments in fact provide any significant increment over medication alone in terms of improving core outcomes (Abikoff et al., 2004). A recent metastudy concluded that stimulant drugs have shown greater effects on symptoms, but that behavioral therapy has shown greater effects on functional impairment outcomes (including work accuracy, grades, lecture notes, essay length and accuracy, and assignment completion) (Sibley et al., 2014).

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ment, had the best long-term outcomes.

[47] There are some that do find evidence. Using data from Iceland, Zoëga et al. (2012a) links medication use and national exam databases. They associate a later start of stimulant drugs with an academic decline in math.

Without regard to the apparently negligible long-term benefits to using stimulant drugs, it has been widely reported – both in the academic literature and the mainstream press – that an increasing share of the adolescent and young adult population has used stimulant drugs to improve productivity and focus (Arria and DuPont, 2010; Greely et al., 2008; Petrow, 2013; Schwarz, 2012a,b; Talbot, 2009; Wilens et al., 2008). The use of stimulant drugs to enhance performance (without a diagnosis) has become common in schools and the workplace. In the 1950s, medical experts believed that stimulant drugs worked exclusively to improve the behavior of children with a neurological defect (and in fact used drug responsiveness as an indicator of a defect). With the discovery that stimulant drugs work just as well for everyone, there seems to be little to prevent casual drug use. Indeed, the use of stimulant drugs by college students and other young adults itself tends to support the idea that the drugs increase short-term focus.

To summarize, despite the lack of evidence linking drugs to long-term benefits, stimulant medications have become the preferred treatment for more than half of those diagnosed. A significant but smaller share of those diagnosed are treated with other pharmaceutical products, cognitive or behavioral therapy, or special education services, either in addition to or instead of stimulant drug treatments, as will be discussed in Chapter 2. Although other studies have been conducted, the results of the MTA study (particularly the findings from the primary paper) were widely publicized. The primary finding – that stimulant drugs were superior to psychosocial treatments – "has become a pillar of pharmaceutical companies' campaigns to market [ADHD] drugs, and is used by insurance companies and school systems to argue against therapies that are usually more expensive than pills" (Schwarz, 2013a, see also Vedantam, 2009 "The drugs' manufacturers distributed thousands of reprints of the article to physicians at a time when diagnoses of ADHD were spiraling upward."). The question, then, is what role pharmaceutical companies and medical professionals have had in pushing this second "epidemic" in stimulant drug use.

1.2.3 Medicalization Explanations for Stimulant Drug Use

Medicalization proponents argue that the dominance of the medical profession and (later) aggressive promotions of stimulant drugs to doctors and the public resulted in an ADHD epidemic. I take up this topic in Chapter 2, but there are two brief points to make now about the relationship between the use of stimulant drugs as the primary treatment for ADHD and the roles of medical professionals and pharmaceutical companies.

First, there is little evidence that medical professionals led the drive toward the creation or use of the ADHD label or the stimulant treatment. The leading pediatric medical organizations were followers in the drive to treat ADHD symptoms with stimulant drugs, moving from lukewarm to guardedly positive views on the topic. The American Academy of Pediatrics (AAP) published its first statement on the topic in 1975, in which it found "a place for stimulant drugs in the treatment of hyperkinetic children" (Kugel et al., 1975, p. 561), but cautioned about the "confusion in relation to diagnosis and appropriate criteria for the use of medication" (Kugel et al., 1975, p. 560). After the adoption of the term attention-deficit hyperactivity disorder, the AAP issued a new statement in 1986 that offered "indications for drug therapy in the treatment of attention deficit disorder," but cautioned about side effects as well as overzealous educators: "In view of requests from other professionals and school personnel to prescribe medications for hyperkinetic children, pediatricians should be cautious of becoming surrogate prescribers of medications" (Committee on Children With Disabilities and Committee on Drugs, 1987, p. 759).

The AAP now advocates for a combined or integrated approach. An updated report, Medication for Children With Attention Disorders, published in 1996, indicated that drug therapy "results in significant improvement in 70% to 80% of properly diagnosed children" but that it should be used as part of an "integrated approach" along with "[p]roper classroom placement, behavior modification, counseling, and provision of structure" (Committee on Children and Disabilities and Committee on Drugs, 1996, p. 302). More recently, the AAP issued two additional reports (Subcommittee on Attention-Deficit/Hyperactivity Disorder and Management, 2011; Subcommittee on Attention-Deficit/Hyperactivity Disorder, 2001), with different treatment indications (the sequencing of drugs and behavioral therapies) for different age groups (Charach et al., 2011; Jadad et al., 1999; Subcommittee on Attention-Deficit/Hyperactivity Disorder and Management, 2011). By contrast, the American Academy of Child and Adolescent Psychiatry – perhaps the organization that has been the most public in its support of a medication-only strategy – recommends beginning medication immediately and supplementing with additional medication when necessary (Pliszka, 2007). Psychosocial treatment is recommended as a secondary treatment only if there is an insufficient response to medication. The American Psychological Association, however, recommends beginning with psychosocial treatments and adding medication if those treatments are insufficient (American Psychological Association, 2006). Others recommend starting with both treatments simultaneously (http://www.chadd.org).

It appears that the resistance to dual treatment approaches – drugs and therapy – stems more from the unwillingness of insurers to cover psychotherapy treatments than from the activism of medical professionals. In a survey of physicians, Hoagwood et al. (2000) found substantial insurance-related constraints associated with the provision of psychosocial services to children with ADHD diagnoses. If true, the demand for the stimulant drugs comes not from physicians, but from elsewhere. It also is important to recognize that stimulant drugs reduce the autonomy of psychiatrists and doctors (e.g. Whooley, 2010), and therefore they are uneasy with it (as demonstrated by the published recommendations). To that end, Klasen (2000), based on interviews with doctors and families, finds that parents valued ADHD labeling as an important aspect of validation and legitimation, while doctors were reluctant because of concerns about scapegoating and self-fulfilling prophecies.

Second, the aggressive promotion of stimulant drugs to doctors and the public is an insufficient explanation for the second ADHD epidemic. One part of this claim is that the epidemic started in the late 1990s because of legal changes related to advertising to physicians and consumers. Proponents of this argument point to U.S. Food and Drug Administration (FDA) guidelines that facilitated direct-to-consumer television advertising (Conrad and Leiter, 2008; Payton and Thoits, 2011), as well as a law that allowed advertising of off-label uses, subject to a variety of constraints, both in the late 1990s. Although there has been a dramatic increase in promotions to physicians and direct-to-consumer advertising since the late 1990s (Donohue et al., 2007), the legal changes cannot explain the current epidemic. Print drug ads directed to consumers have been prominent since 1985 (Palumbo and Mullins, 2002), and off-label prescriptions and uses were both common practices well before the passage of the law regarding marketing of those uses (Salbu, 1999). Moreover, as the previous section argues, the popular press was already promoting the ease of stimulant drug treatments as a panacea for all kinds of organizational problems well before 1997. Rasmussen (2009), for example, describes the increased parental pressure to prescribe during the 1980s.

Although there is striking evidence that physician-directed marketing impacts prescription practices (King et al., 2013), it is less clear how to understand parental support for the decision to medicate. In a content analysis of popular magazines directed towards mass audiences in English speaking North America from 1988–2008, Clarke (2011) finds that ADD and ADHD are portrayed in polarizing and contradictory ways. Although magazine stories are ambivalent about whether ADHD exists, the described research on the causes of ADHD is almost always authoritatively described as either genetic or biological. Moreover, treatment by medication often is portrayed as profoundly problematic. The reality is that by the late 1990s middle- and upper-class adults and children were aware of both the potential benefits and the limitations of the drug and sought out stimulant drugs either because other remedies were not proven or because stimulant drugs were cheaper or covered by insurance. Pharmaceutical marketing undoubtedly contributed to the epidemic, but did not drive the process. There is a stronger argument that parental demand instigated a medicalization process, but I will argue in Chapters 3 and 4 that the influence of parental demand worked to shift the resulting category to something that is not strictly medical. Part of the evidence for this comes in the form of other studies that demonstrate the selective (non-routine) use of medication to treat the symptoms (King et al., 2014).

1.3 Discussion

This chapter argues that the institutional conditions required to make ADHD observable relate back to the labor market restructuring of the 1950s and the development of the federal role in education in the 1960s. Those factors fundamentally altered educational institutions by making them significantly more attentive to the achievement levels of all children and less receptive to non-conformity in the classroom. The disorder did not emerge in the aftermath of World War I, despite research linking brain injury to hyperactivity and inattentiveness and the "discovery" of the paradoxical effects of psychostimulants, because that research involved institutionalized patients. Symptom clusters began to be differentiated outside the custodial framework only with deinstitutionalization. Then, the political advocates of a response to academic under-achievement were disinterested in waiting for concrete neurological evidence to explain or support specific processing deficits. As a result, learning disabilities was carved out of the larger symptom agglomeration. The early success of stimulant drugs in treating behavioral symptoms later bolstered a separate diagnostic category for hyperactivity. The category did not take off in earnest until after the anti-psychiatry movement of the 1960s and 1970s, which encompassed the first moral panic concerning the use of stimulant drugs to control children's behavior. ADD finally was added to the diagnostic lexicon in 1980 after biological psychiatry prevailed over the psychoanalytic approach and new research from cognitive psychology and neurology provided insights on different aspects of attention. Those factors, along with the socio-demographic shift to higher-income students, led to the relegation of hyperactivity to the periphery and the elevation of the uneasy alliance of attention issues and impulsivity to the forefront.

Although scientific progress is not an adequate explanation for the success of the disorder, medicalization cannot explain why ADHD prevalence has increased. The failure of the MBD label and resulting symptom-based categories demonstrated the insufficiency of etiological approaches, and the dominance of the medical profession receded around the time that the category began to emerge. Moreover, pediatricians (at least as an organized group) had guarded views about using stimulant medications to treat children's behavior and learning problems. When drug treatments initially were used to treat non-institutionalized children, the drugs were seen as a second-best solution that would make sense for children from broken homes who were not amenable to the preferred psychotherapeutic approaches; they were not seen as a panacea for a broad range of academic and behavioral troubles. Furthermore, although MBD proponents like Paul Wender adopted a medicalization rhetoric when promoting the efficiency of stimulant drug treatments, the failure of the MBD approach signals the coalition of educators, parents, and other medical experts around a different approach. Ultimately, the success of the category can be attributed to a process that restructured the group defined by the category – going from delinquent behaviors of low SES boys to the (relative) cognitive deficiencies of middle-class children and their mothers. The continuing evolvement in diagnostic criteria has less to do with expansion of the category as it does with redefining the group of symptoms and subjects included to match the new coalition. The current clustering of ADHD with learning disabilities (and apart from behavioral disorders) – a break from past clinical criteria – points to the increased emphasis on the cognitive dimensions of the disorder, which made the disorder more palatable to adults (particularly women).

Chapter 2

An Empirical Test of the Medicalization Hypothesis as an Explanation for ADHD Prevalence

The previous chapter examined the origins of the ADHD label and the factors that led to its widespread acceptance. I explained that the dominance of the medical profession is an unlikely explanation for the label's success because there is no correlation in timing between the surge in diagnoses and the various processes implied by the medicalization thesis. I also showed that most medical organizations, at least publicly, have not advocated for widespread use of stimulant drugs as a stand-alone solution for addressing the symptoms of ADHD. Instead, I argued that the ADHD diagnosis is part of a network through which the interests of children, parents, doctors, and schools are aligned. However, I did not use quantitative data to explore the relationships between medical or educational institutions and the likelihood of diagnosis or treatment choices (if diagnosed).

This chapter uses surveys of nationally representative samples of households with children to address the contributions of medical and educational factors to the diagnosis and treatment of ADHD. I explore how well different measures of medical dominance and social control explain variation in diagnostic prevalence and treatment for school-age children across the United States. Then, I start to unpack the extent to which diagnosis and treatment are explained by educational practices. I use several state-level factors associated with schools, namely, student discipline, achievement pressure, and average incomes. In particular, because children with ADHD are sometimes school-identified as eligible for special education services under the Individuals with Disabilities in Education Act (IDEA),[1] I examine the significance of special education for ADHD diagnosis and treatment.

In what follows, I provide an overview of the medicalization literature and its application to ADHD. I then describe my hypotheses and empirical approach. Finally, I present the results and discuss their implications.

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[1] ADHD is not a separate disability category under the IDEA, but more than 25 percent of the students enrolled in special education have been diagnosed with the disorder (Office of Special Education and Rehabilitative Services, 2003; Schnoes et al., 2006). Students are typically taught in a general education classroom, using approaches such as strategic seating, shortened or modified assignments, individualized instruction, behavior intervention, tutoring, and counseling (Schnoes et al., 2006). As discussed in Chapter 4, these approaches can be used by schools on a voluntary basis (without a special education placement) if the resources to do so permit.

2.1 Medicalization Theory

Medicalization theory combines a social constructivist approach to examine how medical categories are created and a social control approach to ask how behaviors come to be labeled as deviant (Conrad, 2007; Conrad and Barker, 2010; Erchak and Rosenfeld, 1989; Grattet, 2011; Pfohl, 1976). Defined as "a process by which nonmedical problems become defined and treated as medical problems, usually in terms of illnesses or disorders" (Conrad, 1992, p. 209), medicalization has two important elements: (1) a process of increasing medical dominance, leading to (2) the creation of a "medical" object out of behavior that previously was "nonmedical."

Medical dominance, evolving over time, was once at the heart of the theory (Clarke et al., 2010; Conrad, 1992, 2005; Nye, 2003). The idea emerged from several critiques of medicine generated in the 1960s and 1970s. Among the earliest was a critical assessment of psychiatry and its extension of the medical model to mental illness (Horwitz, 2003; Scheff, 1999; Szasz, 1974). Another arose from a claim that mainstream medicine was imperialistic (Freidson, 1984, 2006; Illich, 1976; Larson, 1978). Those critiques both emphasized the role of medical professionals in broadening jurisdiction and reacted, in turn, to the still earlier functionalist approach in medical sociology that emphasized the power of medicine to define and regulate social behavior (Abbott, 1988; Pfohl, 2009).

Building on the growing literatures debating the extension of the disease model to psychiatry, challenging medical imperialism, and assessing medicine's role in regulating deviance, sociologists in the 1970s begin to broaden the claim that medicine had become the predominant paradigm for social control on a widespread scale (Zola, 1972, 1983). Describing "an insidious ... phenomenon" through which medicine becomes "a major institution of social control" (Zola, 1972, p. 487), Zola shifts the emphasis to the ubiquity of medical knowledge, recognizing that earlier critiques of excessively imperialistic medicine overstated the extent of the medical profession's dominance and understated the importance of medical concepts to everyday society (Strong, 1979; Porter, 1999). This reformulation thus makes explicit that social control is achieved not only through the imperialism of the medical profession, but also through society's increased reliance on experts and expert knowledge (Foucault, 1975, 2008; Nye, 2003; Zola, 1972, 1983). With a broader conception of knowledge diffusion, it becomes evident that market-oriented forces and consumers can push medical categories without undermining their definitional centers (Conrad, 2005).

Medicalization theory also emphasizes the contested nature of illness definitions. Thus, some medicalization scholars argue that ADHD is not a "real" disease in the sense that it turns behaviors that have no independent clinical or biological existence into a medical disorder (Conrad, 1975, 2007; Timimi and Leo, 2009). Conrad (2007, p. 147), for example, explains: "[I]t is certainly possible that a small proportion of children with a diagnosis of attention deficit hyperactivity disorder may have a discernible neurological problem, but the identification and diagnosis of ADHD goes far beyond those few children and includes a huge number of children with no identifiable neurological disorder." The implication that medicalized objects are less "real" than other health conditions is in tension with a broader cultural construction approach that considers all medical categories to be contextually situated (Fleck, 1981).[2]

The focus on medicalization at a conceptual level presents several challenges. Without medical boundaries, the meaning of medicalization remains ambiguous insofar as it masks the line between medicine and other institutional discourses that employ the language of pathology in non-medical conceptual models or apart from medical interventions. For this reason, medicalization also eludes any simple measurement approach; the obvious measurement schemes imply the maintenance of jurisdictional boundaries. In what is probably the most extended discussion of measurement, Conrad (2007) suggests that medicalization can

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[2] This is sometimes demonstrated in policy arguments that rely on medicatization arguments. For example, addressing the contribution of medicalization to "the societal problem of spiraling health care costs", Conrad et al. (2010, p. 1943) find that 12 medicalized conditions (including ADHD, anxiety disorders, infertility, male pattern baldness, etc.) are responsible for nearly 4 percent of the total domestic expenditures on health care. Linking medicalized conditions to the societal problem of rising health care costs implies that the spending is excessive because the conditions are not biologically determined.

be measured by the proliferation of categories, the expansion of existing categories, the attribution of symptoms to disease, or the availability of a medical treatment. Only the latter two – measured by the absolute numbers or ratios of those diagnosed or treated – are useful for measuring the extent to which a particular constellation of behaviors can be considered medicalized.

2.2 Medicalization Explanations of ADHD

ADHD and its precursors have long been considered important examples of medicalization. In what purports to be the "first empirical analysis of the process of medicalization," Conrad (2006, pp. 5, 12) associates the "discovery" of hyperactivity with the interplay between three factors: "(1) the pharmaceutical revolution, (2) trends in the medical profession, and (3) government action." Although he says little about specific trends in medical practice and how they resulted in the construction of hyperactivity, a key aspect of the theory is asymmetry between experts and lay actors who are "removed from the public realm" (Conrad, 1975, p. 18). Conrad's (1975) early work also emphasizes the importance of moral entrepreneurs in advancing a deviance classification, pointing to pharmaceutical companies and learning disabilities advocates as proponents of a medical label. Without examining contestation among alternative classifications (see Medina and McCranie, 2011),[3] Conrad concludes that learning disabilities advocates had "sensitized teachers and schools to the conception of hyperkinesis as a medical problem" (Conrad, 1975, p. 16).

Beyond its obvious appeal today, this argument was particularly persuasive at the time it was made in the 1970s. Hyperkinesis was related to what is presently defined as the hyperactivity subtype, enhancing the perspective that "[m]ost of the symptoms for the disor-

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[3] Conrad refers to institutional competition when he explains that medicine has become dominant over social control schemes associated with church and state. But this approach, rooted in the labeling-interactionist tradition, concerns itself more with the transference of dominant deviance explanations from legal or moral ones to medical ones than it does with localized struggles within medicine or between medicine and other classificatory approaches.

der are deviant behaviors" (Conrad, 1975, p. 13). Further, around the time those studies were conducted, the press contained reports of substantial numbers of public school boys taking medication (Fraser, 1970; Maynard, 1970; Ross and Ross, 1976), and several prominent lawsuits against schools alleged that children were forced to receive medication as a condition of continued enrollment (Mayes et al., 2008; Nelkin and Tancredi, 1994; Schrag and Divosky, 1976). The IDEA was amended more than 30 years later to prohibit mandatory medication of children, suggesting that forcible medication was a sufficiently important problem to require a legal response.

More recent writings de-emphasize medical imperialism and move towards expert knowledge-driven approaches that account for variation in levels of medicalization and completeness of medicalization, as well as different normative implications of medicalization and constraints and enablements associated with lay participation and intervention (McLeod and Pescosolido, 2004). Conrad and Schneider (1980b), for example, elaborate three levels at which medicalization can occur: the conceptual, the institutional, and in the physician-patient interaction. With those specifications, medicalization theory contemplates a medical claim that might reside at levels of greater or lesser specificity and involvement with medical professionals. Conrad also distinguishes types of medical control – technological, collaborative, and ideological (Conrad, 1979, 1992) – with successively lower levels of involvement by medical professionals.

Early scholars conceptualized hyperkinesis as an example of technological control – emphasizing the use of licensed medical technologies to achieve social control – particularly as an alternative to traditional forms of student discipline. However, in the absence of legal mechanisms for forcing students to take medication, ADHD is better understood as a purely ideological form of social control or as a potential example of control by "medical collaboration" (Malacrida, 2004). Ideological control is not easily observed in survey data. We could say, on the one hand, that ADHD is self-evidently a medical diagnostic category because it is included within the standard classification of mental disorders used by mental health professionals; on the other hand, we might point to the fact that the medical label is in tension with the categories used by educators and that it is disparaged in the press and public opinion (Sroufe, 2012; Diller, 2011a,b). ADHD as a form of ideological control is hopelessly indeterminate; it is simply too easy to ignore all kinds of knowledge practices imported within the facade of a medical label. The most useful way of understanding medical control is as an example of collaboration; collaboration refers to the role of medical professionals as information providers, gatekeepers, institutional agents, or technicians in the pursuit of the goals of other institutions (Conrad, 1979, 1992). Control by collaboration, in turn, is best observed at the institutional level, where interaction with complementary or competing goals is likely to occur (Malacrida, 2004).

With this understanding, medicalization theory would imply that the rapid expansion of ADHD diagnoses and stimulant treatments is explained by collaboration among medical professionals, schools, and parents (Brancaccio, 2000; McLeod and Pescosolido, 2004). Schools have an incentive to refer ADHD to the exclusive province of the medical professions, acting as if stimulant drugs treat ADHD so well that no special accommodation is necessary in the classroom (Malacrida, 2004; Mayes et al., 2009; Phillips, 2006). Parents accept the label because it supplies a medical explanation for poor classroom performance relative to classmates and because they experience the medical labeling as an important aspect of validation and destigmatization (Conrad and Schneider, 1980a; Klasen, 2000; Oliverio and Lauderdale, 1996).[4] And medical professionals and pharmaceutical companies benefit from increased demand for medical services and stimulant drugs, respectively (Conrad, 2005). Overall, this understanding supplies an explanation in which the label of ADHD and the stimulants satisfy a broad range of interests.

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[4] Bennett (2007) argues that parents seek medical recognition to gain legitimacy in the face of western ideologies that suggest a “bad” child equals a “bad” mother.

2.3 Main Hypotheses

This study examines several specific hypotheses related to the claims of medical dominance and social control of deviance. Although these hypotheses do not necessarily correspond to specific assertions in the literature, they represent important empirical possibilities that are informed by previous research.

Medicalization is a process in which a medical object is created through some form of medical dominance. Regardless of the level at which medicalization occurs, the theory implies some involvement (or alliance) with medical professionals, even under a conception that emphasizes expert knowledge (Conrad, 2005). Conrad (2005) argues, for example, "[m]edicalization still doesn't occur without social actors doing something to make an entity medical, but the engines that are driving medicalization have changed and we need to refocus our sociological eye as the medicalization train moves into the twenty-first century." Following that logic, pharmaceutical companies increasingly are seen as agents of medicalization, particularly when they use direct-to-consumer advertising to promote a medical category and its drug treatment (Clarke et al., 2003; Conrad and Leiter, 2004; Conrad, 2005; Payton and Thoits, 2011).

The *medical dominance hypothesis* thus leads to several predictions. First, the medical dominance hypothesis predicts that the density of medical professionals in a state is positively related to the likelihood of receiving an ADHD diagnosis; relatedly, the density of medical professionals in a state is positively related to the likelihood of receiving a pharmaceutical treatment once diagnosed (Fulton et al., 2009; Hoagwood et al., 2000; King and Essick, 2013). Second, the stringency of state drug laws regarding direct-to-consumer advertising and prescription monitoring is inversely related to the likelihood of receiving an ADHD diagnosis and to the likelihood of receiving a pharmaceutical treatment once diagnosed (Metzl and Herzig, 2007; King and Essick, 2013).

The medicalization perspective also suggests that the medical label will be used to control deviance. If labeling varies with the relational or cultural distance between schools or medical professionals, on the one hand, and patients/children, on the other, then social distance should be predictive of diagnosis and treatment (Horwitz, 2002). Horwitz (2002) explains that labelling is usually done by higher-status people on lower status people, reinforcing existing inequalities,[5] and that the tendency to label an individual as mentally ill varies with the relational or cultural distance between the observer and the actor patients who are culturally and socially distant.[6] The *social control* hypothesis thus predicts that the likelihood of diagnosis and pharmaceutical treatment will be positively related to low socioeconomic status or minority group status (Goffman, 1963). Consideration of this hypothesis is complicated by several push-pull factors: the worse health outcomes of the poor, the likelihood of underdiagnosis for those of lower affluence, and the greater access to disability status and special education systems for those of higher affluence (Boyle et al., 2011; Carrier, 1986; Cuffe et al., 2005; Froehlich et al., 2007; Kelman and Lester, 1998; Lerner, 2004; Olfson et al., 2003; Rowland et al., 2002).[7]

It also is possible to think about social control of deviance by comparing control by medication to other methods of social control. To that end, several researchers have suggested that the prevalence of the disorder is related to the unavailability of alternative disciplinary devices – suspensions, expulsions and the like (Kiger, 1983, 1985; Malacrida, 2003). Kiger (1985) explains that the U.S. Supreme Court's decision in *In re Gault*, 387 U.S. 1 (1967), which mandated due process in juvenile delinquency proceedings, made the suspension and expulsion of students with ADHD symptoms more difficult. As a result, drug therapy replaced the concept of punishment. Consistent with that explanation,

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[5] Medicalization can be a mechanism of social inclusion, bringing lower-status people into contact with medical institutions (Gallagher and Ferrante, 1987).

[6] Conrad and Schneider (1980a, p. 276) argue that medicalization increases as it becomes a middle-class problem rather than solely a lower-class problem; that argument implies a trajectory from the socially distant to the socially near.

[7] Research on treatment utilization is further complicated by the fact that the racial and ethnic group status of nonwhite children with mental health problems might be associated with higher likelihood of stigmatizing attitudes, thus deterring identification and treatment (Bailey et al., 2010; Martin et al., 2007); yet research suggests that, despite racial and ethnic differences in awareness of the disorder, there are no significant differences in treatment preferences (McLeod et al., 2007; McLeod and Pescosolido, 2004).

Ramey (2015) finds that schools and districts with relatively larger minority and poor populations are more likely to implement disciplinary policies and less likely to place students into special education under categories commonly associated with behavior. This is a school- and district-level analysis, so it does not necessarily imply that disciplinary culture influences individual decisions to seek a medical diagnosis or treatment. The *alternative discipline* hypothesis thus predicts that the likelihood of diagnosis will be negatively related to the use of traditional forms of school discipline.

Because a medical diagnosis is not simply a private medical determination but is linked with specific policy outcomes – pharmaceutical treatment, disability accommodations, insurance reimbursement, or special education enrollment, for example – diagnosis and treatment should be related to state and local context. In particular, I expect that there will an inverse relationship between state-level resources and the likelihood of diagnosis and pharmaceutical treatment; I refer to this relationship as the *resource constraint hypothesis.* Nelkin and Tancredi (1994, p. 130) explain that "the focus on biology may direct attention away from social sources of learning problems." In a similar vein, physicians quoted in a New York Times article rationalized the nullification of the diagnostic process on on the grounds that school environments are not always able to help children academically (Schwarz, 2012a). If schools are complicit in the adoption of medical categories so that they efficiently can manage child deviance, then we would expect to find a greater likelihood of diagnosis and treatment in states with fewer resources available for education (Singh, 2006; Schwarz, 2012a). Conversely, a state with greater resources to remediate the social context in which learning occurs should have lower prevalence.[8] At the same time, those same states might place greater demands on schools in terms of academic proficiency; accordingly, I expect that states that value achievement more highly, after controlling for resources, will have higher prevalence. The correlation between state-level edu-

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[8] This hypothesis assumes that a state's education spending leads to lower prevalence; of course, state spending on education also might follow higher prevalence to the extent that increased prevalence funnels more students into special education.

cation spending levels and academic proficiency levels is confirmed in Figure 2.6.2.

Another way to think about the medicalization of ADHD is through its comparison to similar pediatric mental disorders. ADHD is distinct in that medical encroachment is seen as a primary explanation, due to the widespread use of drugs to treat the primary symptoms. For example, if physician density is a better predictor of the likelihood of receiving an ADHD diagnosis than of the comparable likelihood of receiving an autism diagnosis, then this might be evidence that ADHD is medicalized to a greater extent than autism. Thus, the *relative medicalization hypothesis* suggests that the likelihood of receiving an ADHD diagnosis, net of other factors, is more responsive to the density of medical professionals or the stringency of drug laws than the comparable likelihoods of receiving diagnoses for other pediatric mental disorders.

2.4 Data and Measurement

2.4.1 Data

Data for this analysis come from two nationally representative surveys, the National Survey of Children's Health (NSCH) and the National Survey of Children with Special Health Care Needs (CSHCN), both of which were conducted by the Centers for Disease Control and Prevention (CDC). I use the 2011 NSCH and the 2009-10 CSHCN.[9] NSCH is a random-digit-dial telephone survey conducted by CDC as part of the State and Local Area Integrated Telephone (SLAIT) Survey, which is sponsored by the Maternal and Child Health Bureau of the Health Resources and Services Administration. It uses a multistage sampling method based on identification of households with one or more children aged 0-17 years and random selection of a sample child as the interview subject. The NSCH allows for state-level estimates of ADHD prevalence. CSHCN is also part of the SLAIT

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[9] For some analyses, I use the Stata Indicator Data Sets prepared by the Data Resource Center for Child and Adolescent Health, Child and Adolescent Health Measurement Initiative.

Survey. Depending on the health care needs of the children in each household, a detailed interview was conducted for one randomly selected child with special needs, and a brief health insurance interview was conducted for one randomly selected child without special needs.

2.4.2 Measurement

2.4.2.1 Diagnosis, Special Education, and Medication

In both surveys, parents are asked whether their children have been diagnosed or treated for ADHD and about special education enrollment status.[10] ADHD diagnosis was obtained from the question: "Has a doctor or health-care provider ever told you that [child's name] has attention deficit disorder or attention deficit hyperactivity disorder, that is ADD or ADHD?" In the NSCH, treatment was obtained from a question regarding whether the child has "taken any medication because of difficulties with [his/her] emotions, concentration, or behavior" within the previous 12 months. The CSHCN question asks: "At any time during the past week, did [he/she] take medication for ADD or ADHD?" The CSHCN also includes a question about types of medication used by children with ADHD. In the CSHCN, parents are asked "What medications did [S.C.] take for ADD or ADHD?" Responses were recorded to 1 of 17 different drug categories. I consolidated these drug categories into 3 groups: stimulants, which includes all amphetamines (adderall), dextroamphetamines (dexedrine or vyvanse), methylphenidates (concerta, daytrana, metadate, methylin, ritalin, or methyl), and dexmethylphenidates (focalin or dexmethyl); atomoxetines (strattera); and antipsychotics (abilify or risperdal). Special education enrollment was obtained from the questions: "Does [S.C.] have a health problem, condition, or disability for which (he/she) has a written intervention plan called an Individualized Education Program or IEP?" [NSCH] and "Does [S.C.] receive services from a program called Special Educational

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[10] Using parent-reported diagnoses can be problematic if there is non-random variation in the likelihood of accurate reporting, perhaps along the lines of class or race.

Services? Children receiving these services often have an Individualized Education Plan.” [CSHCN] Behavioral treatment was obtained from the question: “At any time during the past 12 months, did [S.C.] receive behavioral treatment for ADD or ADHD, such as classroom management, peer interventions, social skills training, or cognitive-behavioral therapy?” [CSHCN]

2.4.2.2 Individual Background Characteristics

I restrict the analysis to children ages 4-17. Age is categorized corresponding to level in school: 4-5 (preschool), 6-8 (early elementary), 9-13 (late elementary/middle school), and 14-17 (high school). Gender is a binary measure coded male = 1. Race/ethnicity is coded as non-Hispanic white, Hispanic, non-Hispanic black, or multi-racial and other race. Income level is categorized relative to the poverty level for the household, with cutpoints at 100%, 200%, and 400% of the poverty level. I use an indicator of whether the household has medical insurance. An indicator for single parent status is used.

2.4.2.3 State-Level Resource Measures and Policies

The number of physicians comes from the Area Resource File (U.S. Department of Health and Human Services Administration, 2011-2012); I use the number of physicians per 10,000 residents in each state. I use an indicator for whether the state has enacted a law limiting the marketing practices of pharmaceutical companies as a measure of receptiveness to pharmaceutical solutions aimed directly at users. The National Conference of State Legislatures maintains a list of applicable state laws (National Conference of State Legislatures, 2010). As of December 1, 2009, nine states and the District of Columbia, have laws or resolutions restricting pharmaceutical marketing. The specific provisions differ among these states, but they generally either require disclosures of drug marketing costs or place limits on various marketing practices. As an alternative measure, I use pharmaceutical marketing expenditures in each state from the Dollars for Docs Database (Pro Publica, 2013).

Because of settlements and to increase transparency, several pharmaceutical companies began to disclose payments made to physicians in 2009. As of 2013, 17 companies had disclosed more than $4 billion of payments in speaking and consulting fees, travel fees and meals, and other payments. Companies do not provide information on the specific drug or class for which payments were made so marketing expenditures are the expenditures for all drugs. However, three of those companies have a strong market share in the ADHD stimulant market – Eli Lilly, Novartis, and Johnson & Johnson. I use the log of the per capita expenditures for each state (with alternative specifications based on all manufacturers and the three ADHD manufacturers).

School discipline data come from the Office of Civil Rights.[11] I use the number of students subjected to each of the following disciplinary actions: expulsions, suspensions, referrals to law enforcement, and arrests, adjusted for the number of students enrolled within the state. I then created a single factor from these four items using principal components analysis.[12]

State income per capita comes from the Bureau of Economic Analysis; these data, which are logged to minimize skewness, are measured as of the appropriate year in current dollars. As a measure of school-level resources and equitable distribution of resources within states, I use two indices from the School Finance section of EdWeek's Quality Counts website. The spending index includes, among other things, items such as per-pupil expenditures and the percent of taxable resources spent on education. The equity index includes, among other things, the relationship between district funding and local property wealth and the amount of variability in spending across districts.

Finally, based on prior research that attributes prevalence and treatment to the stringency of state achievement standards and accountability laws (Bokhari and Schneider, 2011; Schneider and Eisenberg, 2006; King et al., 2014), I use the state rating from the

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[11] The data are available at http://ocrdata.ed.gov/StateNationalEstimations/.

[12] The factor loadings are: suspensions (.73), expulsions (.68), referrals (.55), and arrests (.76).

Standards, Assessments, and Accountability section of EdWeek's Quality Counts, which equally weights a variety of state measures pertaining to the use of standards, assessments, and accountability.[13] Following King et al. (2014), I use a binary indicator of whether the state has a rating of B or higher (the average rating). Because accountability systems have been somewhat ineffective, as an alternative measure I use a factor created from the percent of 4th and 8th graders in public schools who score at or above the "proficient" level in mathematics or reading on the State NAEP assessment. This measure represents actual proficiency levels rather than the accountability measures put in place for the purpose of producing greater proficiency.

2.5 Analytical Strategy

Using a series of multilevel logistic regression models with children nested within states, I examine the odds of three different types of outcome variables: diagnosis, treatment if diagnosed (prescription drugs or special education), and prescription drug type (for 3 different drug categories) if treated with drugs. I examine whether the density of medical professionals is related to the diagnosis of ADHD and to the medical (drug) treatment of ADHD, as suggested by the medical dominance hypothesis. I also examine whether diagnosis and treatment are related to low socioeconomic status or minority group status, as suggested by the social control hypothesis, and whether diagnosis and treatment are related to state prosperity, as suggested by the resource constraint hypothesis. Because an explanation of the medicalized aspects of ADHD should be able to differentiate ADHD from other pediatric mental disorders, I examine attributes of ADHD that account for variation in diagnosis and treatment of other pediatric mental disorders. To this end, I estimate parallel models for autism spectrum disorders, conduct disorders, learning disabil-

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[13] This consists of items such as the existence of standards that are course- or grade-specific, the use of assessments that are aligned to state standards, and whether states hold schools accountable for performance by using ratings, rewards, or sanctions. Additional description of the inputs is available at http://www.edweek.org/ew/articles/2010/01/14/17sources.h29.html?intc=ml.

ities, anxiety disorders, and childhood depression.

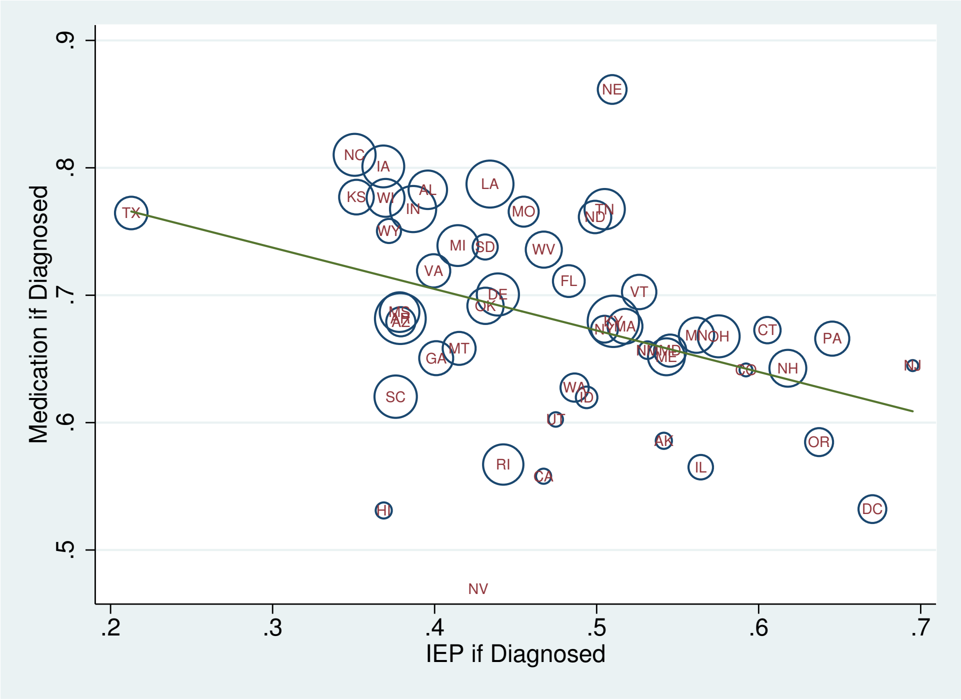
2.6 Results

2.6.1 State Level Patterns

Figure 2.6.1 plots the relationships among the state medication rate (y-axis), the state IEP rate for those diagnosed (x-axis), and the state prevalence rate (represented by the size of the bubble). As shown, states with higher rates of medication use tend to have lower rates of special education enrollment. The two dimensions represented by the x- and y-axes suggest an inverse relationship that seems consistent with a medicalization process in which educators in budget-constrained states shift "deviant" children towards medication (because it is cheaper and privately incurred). The states with higher prevalence rates tend to gather at the high medication/low IEP portion of the graph, although there are noticeable exceptions. Figure 2.6.1 also implies that there is regional variation, with southeastern states grouped at the upper-left portion of the graph and northeastern and western states at the lower-right portion of the graph. Figure A.1 (in the Appendix), depicts the geographic distribution of the outcome measures used in this study; the maps reveal strong regional patterns in state prevalence and treatment rates.

Figure 2.6.2 is a scatterplot matrix that displays the relationships among state prevalence rates and the continuous state-level predictors (physician density, average income levels, levels of school discipline, education spending and equity levels, and academic proficiency levels). The left column shows the regression of each state's ADHD prevalence rate on each of the potential state-level predictors, and the top row shows the smoothed regression of the same relationships. Physician density does not have a significant relationship to ADHD prevalence, but it is positively correlated with average income. The strongest linear relationship to ADHD prevalence is the negative correlation with average income, which is consistent with the resource constraint hypothesis. There also is a strong positive correla-

Figure 2.6.1: Bubbleplot of Treatments. Source: NSCH 2011-12. Note: The bubbleplot shows the state medication rate against the state IEP rate for those diagnosed with ADHD. The bubbles are weighted by the state ADHD prevalence rate. The solid line represents the prediction of medication rates (conditional on diagnosis) from a linear regression on IEP rates.



tion between ADHD prevalence and the level of student discipline, which contradicts the alternative discipline hypothesis. However, the negative relationship between average income and the level of discipline suggests that a multivariate analysis is need to disentangle the effects of average income and disciplinary culture on ADHD prevalence.

2.6.2 State- and Individual-Level Predictors of ADHD Diagnoses

The first set of models predict whether a doctor ever has diagnosed the respondent's child with ADHD. Table 2.1 shows odds ratios from logistic regression models that predict the odds of diagnosis on the basis of an incremental set of independent variables. The models include state random effects and individual- and state-level variables.

Model 1, which includes only demographic characteristics, tests the social control hypothesis. That model suggests that the odds of reporting an ADHD diagnosis are significantly lower for children of all other races than they are for white children. Furthermore, although uninsured children have lower odds of having a diagnosis than insured children (suggesting reduced access to medical care), children living in households with incomes below the poverty level have higher odds of having a diagnosis than children living in households with higher incomes (suggesting weaker noncognitive skills for poorer households). This is consistent with other literature that associates low socioeconomic status with deficits in "noncognitive" skills and that associates those deficits with lower achievement outcomes (Claessens et al., 2009; Duncan et al., 2007; Hsin and Xie, 2012; Lareau, 2003). As reported in previous research, boys have substantially higher odds of having an ADHD diagnosis than girls (Cuffe et al., 2005; Gershon and Gershon, 2002). Race, income, and gender effects do not change significantly as state-level measures and region indicators are introduced in Models 2-5.

Model 2 adds an indicator for states that regulate the marketing of pharmaceuticals and a measure of state-level physicians per capita, both of which are included to test the medical dominance hypothesis. The data are *not* supportive of the hypothesis. There is

Figure 2.6.2: Scatterplot Matrix for State-Level Correlates of ADHD Prevalence. Source NSCH 2011-12, Bureau of Economic Analysis, Area Resource File, 2012 Exit Polls, IDEA Data, and the U.S. Census Bureau. Note: The scatterplot matrix shows the state ADHD prevalence rate against the number of physicians per capita, state per capita income (logged), the state academic proficiency levels, the school spending index, the school financial equity index, and the school discipline index.

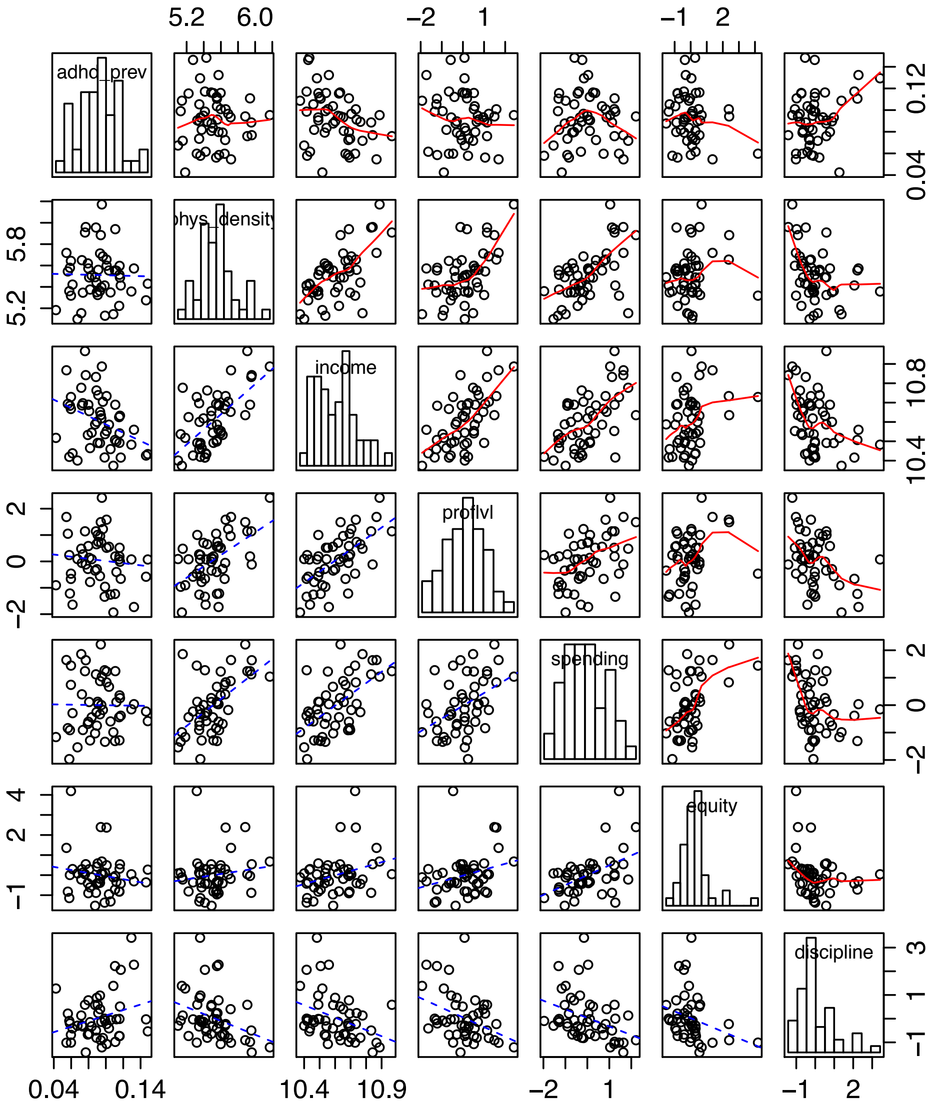


Table 2.1: Logistic Regression of ADHD Diagnosis on Individual- and State-level Predictors Note: + $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$. Respondents from Hawaii and the District of Columbia are not included in Models 4 and 5, because there is no equity score for single-district jurisdictions.

	Model 1		Model 2		Model 3		Model 4		Model 5	
	OR	Std.Err.	OR	Std.Err.	OR	Std.Err.	OR	Std.Err.	OR	Std.Err.
Male	2.411***	(0.063)	2.411***	(0.063)	2.410***	(0.063)	2.390***	(0.063)	2.389***	(0.063)
Race, ref white										
Hispanic	0.612***	(0.027)	0.612***	(0.027)	0.610***	(0.027)	0.592***	(0.027)	0.600***	(0.027)
Black	0.634***	(0.029)	0.635***	(0.029)	0.631***	(0.029)	0.626***	(0.029)	0.614***	(0.029)
Other race	0.858***	(0.037)	0.858***	(0.037)	0.858***	(0.037)	0.898*	(0.039)	0.900*	(0.039)
Pov. level (PL), ref $\leq$ PL										
$>$ PL, $\leq$ 200% PL	0.853***	(0.034)	0.853***	(0.034)	0.854***	(0.034)	0.843***	(0.035)	0.845***	(0.035)
$>$ 200% PL, $\leq$ 400% PL	0.652***	(0.025)	0.652***	(0.025)	0.652***	(0.025)	0.638***	(0.025)	0.639***	(0.025)
$>$ 400% PL	0.584***	(0.023)	0.584***	(0.023)	0.584***	(0.023)	0.570***	(0.023)	0.570***	(0.023)
Level of school, ref early elem.										
Preschool	0.285***	(0.020)	0.285***	(0.020)	0.285***	(0.020)	0.289***	(0.021)	0.288***	(0.021)
Late elem./middle school	1.744***	(0.063)	1.744***	(0.063)	1.744***	(0.063)	1.763***	(0.065)	1.766***	(0.065)
High school	1.978***	(0.072)	1.978***	(0.072)	1.978***	(0.072)	1.990***	(0.074)	1.994***	(0.074)
Uninsured	0.557***	(0.039)	0.557***	(0.039)	0.556***	(0.039)	0.545***	(0.039)	0.545***	(0.039)
Single parent family	1.789***	(0.051)	1.790***	(0.051)	1.789***	(0.051)	1.768***	(0.051)	1.767***	(0.051)
DTC marketing regulated			1.001	(0.081)	1.003	(0.074)	0.925	(0.062)	0.931	(0.042)
# MDs per capita x 10,000			0.999	(0.003)	1.003	(0.003)	1.007	(0.006)	1.008+	(0.004)
Disciplinary climate					1.099**	(0.032)	1.078**	(0.030)	1.048*	(0.019)
Per capita income (log)							0.563*	(0.153)	0.590**	(0.107)
School spending index							1.004	(0.002)	1.003+	(0.002)
School equity index							1.012+	(0.007)	1.003	(0.005)
Proficiency index							1.047	(0.041)	1.054*	(0.028)
Standards and accountability							1.165**	(0.068)	1.017	(0.043)
Region, ref northeast										
Midwest									1.119	(0.082)
South									1.388***	(0.107)
West									0.934	(0.071)
Observations	73527		73527		73527		70810		70810	

no significant difference in the odds of diagnosis based on state physician density or legal restrictions on pharmaceutical marketing. These results do not change if I substitute psychiatrist density or pediatrician density for physician density in the model. Nor do they change if I substitute pharmaceutical marketing expenditures (either overall or for ADHD manufacturers) for marketing regulation.

Model 3 adds the state-level school discipline factor to test the alternative discipline hypothesis. The hypothesis predicts that a higher likelihood of diagnosis will substitute for lower levels of discipline. The predicted negative relationship between student discipline and diagnosis is not seen in the data. Instead, there is a positive relationship between the level of school discipline in a state and the likelihood of an ADHD diagnosis. It appears that whatever factors necessitate stronger discipline also are likely result in a higher likelihood of diagnosis. Put differently, the problem with this hypothesis is that it does not account for the possibility that some students are drawn to psychiatric diagnoses in order to obtain the due process rights that will enable them to avoid school discipline. The unavailability of student discipline is not driving medicalization of deviance; rather, parents and lawyers are constructing and using a disability label to protect students from harsher school discipline policies (a topic to which I return in Chapter 4).[14] Although the magnitude of the odds ratios decrease as additional state-level measures are added in Models 4 and 5, the odds ratios remain significant and above 1.

Model 4 adds the state-level resource and achievement variables. Consistent with the negative correlation at the state level (displayed in Table 2.6.2), children in states with higher average income levels have lower odds of being diagnosed. Presumably, this means that states with more resources do in fact spend more on education (confirmed by the scatterplot matrix in Figure 2.6.2), and therefore children are less likely to be diagnosed

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[14] As noted above, black students have a lower probability of diagnosis than white students. A separate model (not shown here) that interacts race with the state discipline factor suggests that black students have an even lower probability of diagnosis (compared to white students) when they live in states with stronger disciplinary environments.

for the purpose of enhancing their performance by taking stimulant drugs. Other state-level resource measures are consistent with predictions, even though the effects are neither substantial nor consistently significant. School spending and equity have a slight positive effect on the likelihood of diagnosis, as shown in Models 4 and 5, after controlling for state average income levels. This is contrary to the suggestion that ADHD diagnoses substitute for generous levels of state funding, but the results are only marginally significant (at the 10 percent level). The spending-prevalence pattern might be explained by a positive relationship between education funding and the proportion of students enrolled in special education programs (which itself might reflect higher diagnostic rates). Finally, consistent with Bokhari and Schneider (2011) and Schneider and Eisenberg (2006), living in a state with stronger accountability requirements is associated with higher odds of diagnosis once other controls are added, as is the level of academic proficiency in a state, but those results are not consistently significant.

Model 5 adds controls for region, given the strong regional patterns observed in Figure A.1. The odds of diagnosis are significantly higher for students in the south than for students in the northeast. Separate analyses (not shown) suggest that the odds of diagnosis are significantly higher for students in the south than for students in all other regions.

2.6.3 Predictors of Drug Treatment and Special Education Enrollment

The next set of models predict whether a child that has been diagnosed with ADHD is receiving treatment at the time of the survey in the form of pharmaceutical treatment, school special education placement (IEP), or both. Table 2.2 shows odds ratios from a multinomial model predicting prescription drug use and IEP status, conditional on ADHD diagnosis.[15] The base category for the dependent variable is no pharmaceutical treatment

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[15] I did not use a random effects model because a likelihood ratio test that compared the random effects model to this model was not significant.

and no IEP and represents 15 percent of the students diagnosed with ADHD; the other categories are IEP only (15 percent), pharmaceutical treatment only (the medicalization paradigm and 40 percent), and both IEP and pharmaceutical treatment (30 percent). I use the same predictors included in the models predicting diagnosis, except that I also include controls for the number of chronic conditions with which a student has been diagnosed to account for the possibility that socio-demographic differences in symptom severity are influencing the results.[16]

Among the diagnosed, there is no gender difference in the likelihood of using a drug treatment compared to having no treatment, but boys have greater odds than girls of having an IEP. Black, Hispanic and other race students have lower odds of having a drug treatment (with or without an IEP) than white students. Children from families with larger incomes have significantly higher odds of having a drug treatment (with or without an IEP). In other words, higher income white students have a pattern of use that seems consistent with a medicalization process, but I will argue indicates performance enhancement. Table 2.2 provides no support for the social control hypothesis, because white, high income children are more likely to receive drug treatments, once diagnosed.

With respect to the state-level predictors, state regulation of pharmaceutical marketing reduces the odds that a child in the state who is diagnosed with ADHD will receive a prescription drug treatment, which supports the medicalization hypothesis. However, the odds of an IEP are higher in states where there is greater physician density. This is consistent with the learning disabilities model that I discuss below; it suggests that the educational disability categories (and IEPs) are more dependent on availability of medical specialists (presumably for psychometric testing). This assumption is further buttressed by the fact that substituting psychiatrists for MDs increases the magnitude of the effects. Furthermore, stricter school accountability laws reduce the odds of having an IEP, which suggests that schools that are more “accountable” for the proficiency levels of students

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[16] Table A.2 displays comorbid conditions for children with ADHD diagnoses, by race.

Table 2.2: Multinomial Logistic Regression of Pharmaceutical Treatment and IEP Status on Individual- and State-level Predictors, Conditional on ADHD Diagnosis. Reference Category is Modal Category of Pharmaceutical Treatment without Special Education Enrollment. Note: + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

	(1) IEP Only		(2) Drug Only		(3) IEP/Drug	
	OR	Std.Err.	OR	Std.Err.	OR	Std.Err.
Male	1.293**	(0.127)	1.013	(0.073)	1.445***	(0.122)
Race, ref white						
Hispanic	0.864	(0.130)	0.616***	(0.074)	0.546***	(0.075)
Black	1.202	(0.183)	0.493***	(0.062)	0.635**	(0.088)
Other race	0.936	(0.144)	0.694**	(0.083)	0.675**	(0.092)
Pov. level (PL), ref ≤ PL						
> PL, ≤ 200% PL	1.026	(0.148)	1.272*	(0.144)	1.155	(0.146)
> 200% PL, ≤ 400% PL	1.276+	(0.177)	1.572***	(0.171)	1.430**	(0.174)
> 400% PL	1.240	(0.179)	2.081***	(0.231)	1.765***	(0.221)
Level of school, ref early elem.						
Late elem./middle school	1.490**	(0.220)	1.178	(0.123)	1.390**	(0.167)
High school	1.213	(0.174)	0.555***	(0.057)	0.751*	(0.089)
Uninsured	0.932	(0.200)	0.507***	(0.091)	0.241***	(0.062)
Single parent family	0.945	(0.097)	1.095	(0.085)	1.190*	(0.105)
DTC marketing regulated	0.995	(0.127)	0.844+	(0.082)	0.954	(0.105)
# MDs per capita x 10,000	1.032*	(0.013)	1.012	(0.010)	1.017	(0.011)
Disciplinary climate	0.981	(0.053)	1.017	(0.039)	0.966	(0.044)
Per capita income (log)	1.971	(1.032)	0.751	(0.299)	1.787	(0.812)
School spending index	0.998	(0.005)	0.998	(0.004)	0.997	(0.004)
School equity index	0.988	(0.014)	1.005	(0.011)	0.997	(0.012)
Proficiency index	0.892	(0.066)	0.984	(0.057)	0.967	(0.064)
Standards and accountability	0.651***	(0.080)	0.887	(0.082)	0.748**	(0.079)
Region, ref northeast						
Midwest	1.031	(0.217)	1.407*	(0.232)	1.129	(0.207)
South	1.098	(0.240)	1.407*	(0.240)	1.239	(0.236)
West	1.207	(0.260)	0.921	(0.159)	0.789	(0.151)
Number of conditions	2.522***	(0.093)	1.876***	(0.062)	3.289***	(0.114)
Constant	0.000+	(0.000)	6.207	(26.344)	0.000+	(0.001)
Observations				7531		

with disabilities are more likely to place those students in general education environments where they learn the material required to perform on standardized tests (see a similar explanation in Harr-Robins et al., 2013, 2015).

Table 2.2 does not provide direct support for the idea that minority students are significantly more likely to be enrolled in special education programs than to receive no treatment. However, reversing the reference category to ask how likely minority students are to be placed in all other categories compared to the medicalized (drug only) category, the racial gap appears. Children from all other racial groups compared to white students are more likely to be in the no treatment or the IEP treatment categories compared to the drug-only treatment category. This finding is consistent with evidence that poor and minority students are disproportionally placed in special education programs (Coutinho et al., 2002; Hibel et al., 2010; Kelman and Lester, 1998; Lerner, 2004; Skiba et al., 2005) and with evidence that special education has a negative or nonsignificant effect on many learning and behavioral outcomes (Morgan et al., 2010). Overall, there is evidence of a two-tiered public-private system in which the children of richer parents avoid the stigma and association with lower class children by buying pharmaceutical treatment privately. Treatment is an enhancer that allows them to avoid being part of special education. Poor parents do not have the resources, the information networks, or the confidence to do the same, and they also might lack the capacity to resist the special education placement. One possibility, suggested by these findings, is that the medical diagnosis is a funnel for two groups – wealthier households who use the diagnosis to obtain prescription drug treatments and poorer households that are pushed towards the diagnosis as a pathway to obtaining services for their children.

2.6.4 Determinants of ADHD Drug Type

The effectiveness of different types of drugs varies by individual and is not subject to easy generalizations, so the conclusions that can be drawn from an analysis of the socio-demographic determinants of the types of drugs that are prescribed are quite limited. Stimulant drugs for children with ADHD have been widely used, and they have been validated to varying degrees in long-term effectiveness studies (MTA Cooperative Group, 1999b,a, 2004). Strattera (atomoxetine) also has been approved for use in treating ADHD, and it has been the subject of effectiveness studies (Vakula et al., 2010). The use of antipsychotic drugs in treating children with ADHD has increased, but this use is considered off-label and has not been the subject of safety and effectiveness studies (Olfson et al., 2012). One medical expert explained that methylphenidate and amphetamines (the stimulants, or performance enhancers) are considered first line in the treatment of ADHD, the second line is Strattera, and the last resort is antipsychotics (Stubbe, 2006).

Accepting that ordering for these purposes, the next question is whether there are race or income effects associated with the type of drugs prescribed for students with ADHD. I used the 2009-10 CSHCN to answer this question. Columns (1)-(3) of Table 2.3 show odds ratios from models predicting whether a child has received a stimulant drug, an antipsychotic drug, or atomoxetine (Strattera), conditional on diagnosis and drug treatment. I use state fixed effects to account for unobserved differences between states, because I am primarily interested in testing the social control hypothesis. Because the CSHCN also asked respondents whether the child received special education services and whether children received behavioral treatment for ADHD (defined as classroom management, peer interventions, social skills training, or cognitive-behavioral therapy), I estimated separate models with those treatments are the dependent variables. Those models are conditional on diagnosis, and the findings are shown in columns (4) and (5) of Table 2.3.

Table 2.3 suggests that boys have higher odds than girls of using antipsychotic medications to treat their conditions, but there are no gender effects in the use of atomoxetine or stimulant drugs. There are notable racial differences in the use of drugs of different types. Black children have significantly lower odds of using atomoxetine than white children, and black children have significantly higher odds of using antipsychotic medications

Table 2.3: Logistic Regression of Treatment Type on Race, Gender, and Income, with State Fixed Effects. Note: + $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

	(1) Stimulant		(2) Antipsychotic		(3) Atomoxetine		(4) Behavioral Therapy		(5) IEP	
	OR	Std.Err.	OR	Std.Err.	OR	Std.Err.	OR	Std.Err.	OR	Std.Err.
Age in years	0.996	(0.011)	0.975	(0.018)	1.043**	(0.015)	0.938***	(0.006)	1.012*	(0.006)
Male	1.082	(0.084)	1.564**	(0.228)	0.929	(0.090)	1.129*	(0.055)	1.277***	(0.054)
Race, ref white										
Black	0.979	(0.129)	1.608**	(0.288)	0.497**	(0.108)	1.580***	(0.126)	1.234**	(0.086)
Other race	1.045	(0.122)	0.929	(0.181)	0.930	(0.139)	1.204**	(0.086)	1.164*	(0.072)
Hispanic	0.868	(0.110)	1.532*	(0.297)	0.762	(0.140)	1.075	(0.088)	1.035	(0.073)
Pov. level (PL), ref ≤ PL										
> PL, ≤ 200% PL	1.181	(0.126)	0.687*	(0.109)	0.873	(0.124)	0.924	(0.064)	0.871*	(0.053)
> 200% PL, ≤ 300% PL	1.165	(0.131)	0.589**	(0.104)	0.968	(0.141)	0.936	(0.070)	0.777***	(0.050)
> 300% PL, ≤ 400% PL	1.547***	(0.202)	0.361***	(0.084)	0.829	(0.134)	0.785**	(0.063)	0.672***	(0.047)
> 400% PL	1.668***	(0.178)	0.285***	(0.054)	0.773+	(0.105)	0.771***	(0.052)	0.571***	(0.034)
Observations	6484		6484		6484		8705		11550	

than white children. Hispanic children also have higher odds of using antipsychotic medications than white children. With respect to income level, children living in households with higher income levels have higher odds of using stimulant drugs than children living in low-income households; similarly, children living in higher-income households have lower odds of using antipsychotic drugs than children living in low-income households. The final two columns display comparison models that use behavioral therapy treatment and IEP as the dependent variables, conditional on diagnosis. Consistent with earlier models, black students and poorer students are more likely to have IEPs than white students and richer students, respectively. It is often thought that psychosocial treatments are used most heavily by white, upper class students. However, these data suggest that poor and minority students are more likely to have behavioral therapy than rich and white students, respectively, which is probably attributable to the broad definition of behavioral therapy (including such things as classroom management and peer interventions that could be forms of classroom discipline).

These findings are inconsistent with the view that stimulant drugs are being used as a social control device. It is the wealthier and white children who are given stimulant drugs to treat their ADHD symptoms, while black and poor children are more likely to be subjected to the traditional social control treatment of antipsychotic medications. This, again, is reflective of a two-tiered system – with performance enhancement for those of higher social class status and social control for those of lower social class status.[17] Although one could argue that performance enhancement is the form the medicalization process takes as it reaches the upper classes – a process in which the need to compete in school is responded to with a medical solution – I argue that it is better seen as a looping effect of an initial medicalization process. The medicalization as social control story works for the poorer, minority kids, but they are only half the story. The other half is performance en-

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[17] King et al. (2014), for example, find that medical adaptation to academic pressure – measured by selective use of stimulants only during the academic year – is more common for socioeconomically advantaged children than for less advantaged children.

hancement, which was not a concern at the time the behaviors were "made medical." The reason for this, as I will discuss in Chapter 4, is that this new coalition forms around a label that is no longer just "medical."

2.6.5 Comparing Pediatric Mental Disorders

Finally, I consider whether ADHD is more completely medicalized than other pediatric mental disorders. First, I ask the baseline question: Are children with ADHD more likely to use a pharmaceutical treatment than children with other mental disorders? To examine this question, I used the 2011 NSCH to estimate the proportions of children (ages 4-17) that have been diagnosed with five other pediatric mental disorders and that use a pharmaceutical treatment to treat problems with emotions, concentration or behavior. I found that a higher proportion of children diagnosed with ADHD than children diagnosed with other disorders use medication. Yet, more than one-third of children with diagnoses for other major pediatric mental disorders use a drug treatment. Compared to ADHD where 66 percent of children with the disorder use medication, 42 percent with autism, 34 percent with learning disabilities, 57 percent with behavior disorders, 58 percent with depression, and 52 percent with anxiety disorders use prescription medications.

Going a step further, I estimated random-effects models comparable to Model 5 of Table 2.1 to consider whether physician density is a better predictor of the likelihood of receiving an ADHD diagnosis than of the comparable likelihood of receiving a diagnosis for another pediatric mental disorder. Table 2.4 reports the results, with columns for five other pediatric mental disorders – autism, learning disabilities, behavior disorder, anxiety, and depression – which were the dependent variables in these models.

Table 2.4 suggests that the effects of physician density on diagnosis are most substantial for learning disabilities and anxiety disorders. This is likely a result of the fact that learning disorders depend on neuropsychological assessments and pedagogies. Restrictions on direct-to-consumer marketing have a pronounced effect on the likelihood of receiving a

Table 2.4: Mixed Level Logistic Regression of Diagnosis Type on Individual- and State-level Predictors

	Autism		LD		Behavior		Anxiety		Depression	
	OR	Std. Err.	OR	Std. Err.	OR	Std. Err.	OR	Std. Err.	OR	Std. Err.
Male	3.811***	(0.226)	1.883***	(0.049)	2.102***	(0.086)	1.220***	(0.037)	1.082*	(0.041)
Race, ref white										
Hispanic	0.591***	(0.052)	0.902**	(0.036)	0.783***	(0.049)	0.663***	(0.036)	0.835**	(0.053)
Black	0.623***	(0.061)	0.870**	(0.040)	0.893+	(0.057)	0.376***	(0.027)	0.567***	(0.043)
Other race	1.063	(0.084)	0.999	(0.043)	1.183**	(0.074)	0.883*	(0.047)	1.073	(0.069)
Pov. level (PL), ref ≤ PL										
> PL, ≤ 200% PL	0.950	(0.075)	0.732***	(0.028)	0.721***	(0.039)	0.830***	(0.042)	0.729***	(0.041)
> 200% PL, ≤ 400% PL	0.752***	(0.058)	0.490***	(0.019)	0.432***	(0.024)	0.616***	(0.030)	0.480***	(0.027)
> 400% PL	0.613***	(0.049)	0.385***	(0.015)	0.298***	(0.018)	0.613***	(0.030)	0.379***	(0.023)
School level, ref early elem.										
Preschool	0.772**	(0.070)	0.541***	(0.032)	0.412***	(0.037)	0.418***	(0.036)	0.357***	(0.058)
Late elem./middle school	1.192**	(0.079)	1.668***	(0.063)	1.192**	(0.064)	1.809***	(0.087)	3.135***	(0.255)
High school	0.915	(0.065)	1.976***	(0.074)	1.300***	(0.071)	2.273***	(0.109)	7.352***	(0.578)
Uninsured	0.451***	(0.073)	0.655***	(0.042)	0.704***	(0.067)	0.571***	(0.051)	0.546***	(0.056)
Single parent family	1.433***	(0.081)	1.371***	(0.040)	2.318***	(0.097)	1.876***	(0.066)	2.380***	(0.099)
DTC marketing regulated	0.990	(0.081)	1.158**	(0.053)	0.975	(0.064)	1.103	(0.068)	1.069	(0.088)
# MDs per capita x 100000	1.009	(0.008)	1.009*	(0.004)	1.003	(0.006)	1.012*	(0.006)	1.002	(0.008)
Disciplinary climate	0.997	(0.034)	1.004	(0.019)	1.034	(0.027)	0.981	(0.025)	0.973	(0.033)
Per capita income (log)	0.854	(0.254)	1.101	(0.185)	0.724	(0.174)	0.743	(0.166)	0.748	(0.218)
School finance index	1.102	(0.079)	0.966	(0.039)	1.012	(0.057)	1.061	(0.058)	0.990	(0.070)
Accountability index	0.872+	(0.062)	0.999	(0.040)	0.978	(0.055)	0.929	(0.049)	0.902	(0.062)
Region, ref northeast										
Midwest	0.919	(0.102)	0.836**	(0.053)	0.906	(0.083)	0.858+	(0.073)	1.038	(0.116)
South	1.045	(0.132)	0.875+	(0.063)	0.926	(0.095)	0.884	(0.085)	0.983	(0.125)
West	1.009	(0.128)	0.902	(0.065)	0.796*	(0.083)	0.879	(0.085)	1.030	(0.131)
Observations	70945		70845		70986		70964		70967	

diagnosis of a learning disability. These data suggest that what is seen as a learning disability or anxiety disorder might be interpreted as ADHD in another environment. The regional dummies are consistent with this explanation. Although there is a strong regional pattern exhibiting high ADHD prevalence in southern states, learning disabilities are less common in southern states. What this really says is that ADHD diagnoses are more common where there are fewer doctors and fewer medical resources; in effect, they become an alternative to medicalization or a form of infra-medicalization.

Black children have significantly lower odds of receiving each of these diagnoses compared to white children, except for behavior disorders. Further, the odds of receiving a diagnosis for any pediatric mental disorder in the study are lower at higher levels of income, compared to children living in households with income levels below the poverty level. In other words, those with lower income levels have poorer health outcomes. The lesser decline in the odds ratios at successively higher income categories for autism and ADHD suggests that those categories are less likely to be used as instruments of social control.

2.7 Discussion and Conclusion

In this chapter, I use nationally representative survey data to address the prominent claim that ADHD results from a medicalization process in which medical professionals and pharmaceutical companies collaborate with schools and parents to produce a medical category that facilitates the control of deviant behaviors. I examine the predictors of ADHD diagnoses, the use and types of drug treatments for children with ADHD, and the enrollment of children with ADHD in special education programs, with a view to understanding the extent to which medical institutional factors, racial, ethnic, and socioeconomic background, and state-level resources contribute to diagnosis and treatment outcomes. Overall, my findings suggest that medical dominance is not a useful way to understand diagnostic rates. Inconsistent with the medical dominance hypothesis, I find that the density of medical professionals is only weakly predictive or not predictive of the odds of an ADHD diagnosis after accounting for individual-level factors and state average incomes and other state-level measures. Physician density and marketing restrictions appear to have the opposite effects on ADHD and learning disabilities. In other words, physician density increases the odds of diagnosis for learning disorders but not the odds of diagnosis for ADHD, and marketing restrictions increase the odds of diagnosis for learning disorders but not the odds of diagnosis for ADHD. This suggests that ADHD might work, in part, as a residual category for students with learning problems who live in the south. Furthermore, I find substantial evidence that ADHD is not related to social distance. Black children have substantially lower odds than white children of receiving an ADHD diagnosis and of receiving prescription drug treatments if diagnosed; black children have higher odds than white children of being placed in special education and of receiving antipsychotic medications if treated with drugs. Similarly, children from wealthier households have lower odds of diagnosis than children living in poverty, but are significantly more likely to receive prescription drug treatments if diagnosed and stimulant drug treatments if treated with prescription drugs. I suggest that the findings are consistent with the presence of at least two different phenomena – a class effect in which rich, white children pursue a performance enhancement route and poor, minority children are funneled into special education, and a strong regional effect. I argue, therefore, that even if the medicalization/social control hypothesis was correct when it was formulated in 1970s, there have been looping processes that make it much less relevant today.

My findings are limited in some respects. I do not have a measure of symptoms that is adequate to account for differences in neurological function or severity of symptoms. I do not have a measure of different physician practices, so it is not possible to disentangle whether different patterns of diagnosis and treatment are caused by the lack of access to medical care or variations in the tendency to diagnose and treat. A survey of physicians, for example, revealed differences in physician perceptions of the severity of ADHD symptoms (Sheldrick et al., 2015). Finally, the data are not clustered to allow for examination of school effects. Additional research is needed to focus specifically on the interaction of the medical object with knowledge practices that reside within schools. Despite those limitations, this research attempts to show the difficulties of a theory that only follows medical actors. Although some facts can be adduced to support the argument, it seems clear that this account is incomplete. The medicalization critique contains a compelling argument, but this research shows that significant contingency exists for one of its core examples.

Chapter 3

The Importance of Parents, Teachers, and School Environments for ADHD Diagnoses

The previous chapter examined the claim that ADHD results from a medicalization process. After documenting variations in diagnosis and treatment according to age, gender, race and ethnicity, and socioeconomic status on the individual level and according to region and resources and education policies in the state in which a student resides, I argued that the findings display class effects such that children are funneled into the diagnosis to fulfill two different functions: performance enhancement if they are white or high socioeconomic status or social control if they are non-white or low socioeconomic status. Medicalization does not supply an obvious explanation for the duality. I suggested that the use of the diagnosis for performance enhancement or social control can depend on macro-level institutions, including resource availability, state-level school disciplinary culture, and state-level academic achievement culture. I also suggested that ADHD is more likely to substitute for learning disabilities in certain regions. Chapter 2 thus alluded to the possibility that schools play a role in advancing the diagnosis, but did not test the contributions of schools to diagnostic prevalence.

The cognitive and behavioral attributes of children are so interlinked with education that any theory of the disorder's prevalence must account for the roles of teachers and schools in addition to the macro-level factors that influence schools. The medicalization literature views schools as passive agents of pharmaceutical companies and medical experts or as their willing collaborators. That perspective assumes either that teachers and schools accept that ADHD is a medical problem — one best left to the expertise of medical experts — or that schools recognize the beneficial effects of stimulant drug treatments on classroom behavior and performance. Thus, medicalization explains the emergence and widespread use of the ADHD diagnostic label, at least in part, by pointing to the need to achieve social control of deviant children within schools, particularly when other disciplinary measures are inadequate. To that end, medicalization theory would predict that the disorder primarily is a reaction to behavioral non-conformity rather than cognitive difficulty that results in sub-standard academic performance.

Although my analysis sets off both medicalization and biological determinism as alternate theories, there is at least one variant of medicalization that seems consistent with the findings from Chapter 2. The idea that parent activists are key drivers of diagnostic expansion seems incontestable. Given the incomplete effectiveness of pharmaceutical treatments,[1] there is likely to be an ongoing negotiation and contention among students, parents, teachers, and schools. Schools both produce and embed cultural knowledge about children's behavior and approaches to treatment (Singh, 2006; Malacrida, 2004), so we would expect to find variations in the perception and tolerance of young children's behavior, educational and behavioral goals for children, and styles of treating problem behaviors. Malacrida (2004), for example, compares the more extensively medicalized version of the disorder in Canada with the less medicalized version in Britain and points to the relative difficulty in Canada of suspending or expelling children from schools (essentially a macro-level explanation). Her interviews, however, suggest that the differences in disciplinary systems enabled an interactional process in which Canadian educators were more likely to suggest the need for medical treatment to parents, while British educators were ambivalent or even hostile to the medical label and instead more likely to suggest that families seek psychotherapy to address the emotional needs of their children. Given the variability in the school-parent interaction, it is a stretch to say that the "definitional center" remains "constant" in the category that emerges, as medicalization theory would claim (Conrad, 2005, p. 10). In this chapter, therefore, I investigate the school determinants of symptom levels and diagnoses.

There has been little research into the contributions of teachers and schools to the

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[1] As discussed in Chapter 1, medications do not improve inattention or impulsivity symptoms in all children (Committee on Children and Disabilities and Committee on Drugs, 1996), and even when they do minimize those symptoms temporarily, the effects tend to diminish over time (MTA Cooperative Group, 2004). Further, medications sometimes improve one set of symptoms, while worsening another (Committee on Children and Disabilities and Committee on Drugs, 1996; Hale et al., 2011; Swanson et al., 1991), and the side effects may require accommodations in the school environment (Committee on Children and Disabilities and Committee on Drugs, 1996). Finally, abuse and misuse are notable problems (Wilens et al., 2008).

identification of the underlying behaviors and cognitive attributes of students that result in a diagnosis. It also remains unclear whether such systematic differences in diagnostic rates are explained by different symptom profiles *as they manifest* in school contexts. Furthermore, the parental response to the school identification or failure to identify symptoms remains unexamined. To that end, this chapter uses a longitudinal study that tracks a 1999 cohort of kindergarten children through eighth grade to examine the contributions of teachers and schools to parent-reported incidence of ADHD. This chapter embraces the notion of parents as drivers of diagnostic expansion by examining how teachers respond and react to the non-cognitive skills of children and how those responses relate to ADHD prevalence. In what follows, I provide an overview of the school effects literature related to ADHD. I then describe my hypotheses and empirical approach. Finally, I present the results and discuss their implications.

3.1 Existing Research

School effects research typically investigates the association between student achievement and aggregate school characteristics or institutional school attributes. In this chapter, however, I consider the association of school characteristics and medical intervention in the form of diagnosis for attention deficit disorders. This approach provides insight into the school-related factors that are associated with diagnostic prevalence. Under the traditional medical model, diagnosis occurs during an interaction between the patient and family and a physician, during which the physician responds to the absolute level of the patient's symptoms. Variation in diagnosis and treatment is attributed to differential access to medical care or local medical culture, and any coincidental variation in school prevalence would be attributed to the average characteristics of the student body. Social scientists, however, have identified several ways in which school characteristics relate to the identification of symptoms and to diagnosis and treatment.

3.1.1 Schools and Teachers and the Identification of ADHD Symptoms

Starting with the identification of symptoms, the role of the teacher is apparent. Because teachers are often the first to identify ADHD symptoms (Mayes et al., 2008; Sax and Kautz, 2003), variation in the likelihood that teachers will recognize and act on the symptoms is expected. Symptoms typically do not appear until a child is placed in a learning environment in which demands on attention and behavior emerge. The diagnostic criteria, for example, directly connect the disorder to the school setting when they list symptoms such as "makes careless mistakes in schoolwork," "often blurts out an answer," "has difficulty waiting his or her turn," and "often leaves seat." More fundamentally, the diagnostic criteria accord teachers a formal role in the process with the mandate that symptoms be observed in two or more settings and that confirmation of symptoms across settings be based on consultation with informants in those settings. Furthermore, teacher rating scales assume that assessments consider the context of what is appropriate for children of the same age (Brock et al., 2009; National Institute of Mental Health, 2008), which suggests the possibility of comparative judgments within a class or school.[2] These comparisons vary with teacher characteristics and experience and are influenced by the child's background (as well as the advocacy of parents). Nevertheless, teacher and school incentives do not always align with those of parents. Teachers have an interest in detecting and managing disruptive children, but they might have beliefs about psychiatric disorders that lead them to dissuade parents of the need for diagnosis or treatment (Malacrida, 2004). Teachers also are employed by schools that might wish to deter the special education placements or other accommodations that can follow a diagnosis.

Student behaviors also vary with school context. Behavioral or learning problems might

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[2] The principal interaction between the teacher and physician is indirect. It occurs in the context of the diagnostic process where the teacher completes a rating scale assessing the child's symptoms in the school setting; in some cases, there are follow-ups with the teacher who monitors the therapeutic effects of different medication dosages as they are gradually increased (Sprague and Gadow, 1976).

be sensitive to class size, teacher experience or quality (Jennings and DiPrete, 2010; Dee and West, 2011), or to the structures used to accommodate different learning styles within the regular curriculum. Peer influence also affects the behaviors and learning motivations of students (Neidell and Waldfogel, 2010; Gottfried, 2014), which could influence the appearance of symptoms (and their recognition and evaluation by teachers). One possibility is that high SES students are found in more competitive academic environments that also discourage problem behaviors. Deviance from a demanding standard might be more likely to result in diagnosis. Alternatively, schools with more resources might accommodate different learning styles more readily. If so, students attending poorer schools (presumably low SES schools) might be more likely to exhibit symptoms.

3.1.2 Relative Age Effects and ADHD Diagnoses

The research that examines contextual factors associated with ADHD diagnosis and treatment is narrowly framed. One prominent claim in the literature is that children who turn 5 shortly before the kindergarten eligibility cutoff date under state law are more likely to seem hyperactive and to diagnosed with ADHD, with the implication being that teachers – and parents, indirectly – are forming and applying classroom expectations on a relative basis rather than against some independent benchmark for age-appropriate behavior and development. Studies in the United States, Canada, and Iceland have found that children who are young within grade level are more likely to be diagnosed with ADHD at some time in their elementary or middle school years (Elder, 2010; Elder and Lubotsky, 2009; Evans et al., 2010; Krabbe et al., 2014; Morrow et al., 2012; Zoëga et al., 2012b).[3] Using data from the ECLS-K, Elder (2010, p. 642) finds that "the key mechanism" driving relative age effects in diagnosis is kindergarten teacher ratings of sociobehavioral skills (implying that teachers rate students in comparison with their peers rather than against some

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[3] At least one other study finds no such effects (Biederman et al., 2012), but this study did not account for actual kindergarten entry or the aggregate age characteristics of the child's school or state.

external developmental benchmark). He found larger discontinuities around eligibility cutoffs in teacher reports than in parent reports.[4] The conclusion those authors draw is that younger children are developmentally immature and might not actually "have" ADHD. Elder (2010, pp. 641-42), for example, argues that the relationship between school starting age and ADHD suggests that teacher ratings are "subjective" and the resulting diagnoses are "inappropriate"; he estimates that 20 percent of children who use stimulants "have been misdiagnosed." Evans et al. (2010, p. 660) reach similar conclusions using data from the NHIS and suggest that the findings "represent true misdiagnosis of ADHD." The policy implications are considerable. A New York Times editorial, for example, raises a concern that universal pre-kindergarten will lead to an "epidemic" of 4- and 5-year olds "being wrongfully told that they have" ADHD (Hinshaw and Scheffler, 2014a).

Although the existing studies do not situate the effects along the longitudinal pathways to diagnosis and treatment,[5] the implication is that younger elementary students are simply too immature, in many cases, to conform with the demands of formal schooling. Elder and Lubotsky (2009, p. 667), for example, suggest that younger children are "more likely to suffer from shortcomings in skills or maturity by the end of kindergarten, and these deficits lead teachers and parents to suggest professional evaluation and grade repetition." Nevertheless, the outcome variable in their study – ever being diagnosed – is measured as a positive response during any survey year, which obscures the process through which kindergarten immaturity might lead to diagnosis. Those studies also assume that state cutoff dates for kindergarten entry are a meaningful predictor of relative

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[4] This research generally assumes agreement among parents and teachers or parent passivity, neither of which is necessarily true. The extent of agreement between teachers and parents as to symptom levels is an empirical question; Wolraich et al. (2004), for instance, reports low agreement between parent and teacher reports of ADHD symptoms. And in the absence of agreement about symptoms, the consequences of disagreement for diagnosis are not clear.

[5] Evans et al. (2010) find that the effects of relative age on diagnosis in the United States are somewhat larger for the 7-12 cross sectional age groups than for the 13-17 age group, but they do not use longitudinal data or information about school context. In a study of Canadian schools, Zoëga et al. (2012b) identified effects on the probability that students took stimulant drugs at some time between the fourth and seventh grades.

age, but they do not consider whether or to what extent school districts (and parents) observe those cutoffs. In addition, they exclude data for students in a significant number of large states that do not have state-wide cutoff dates. Even more fundamentally, however, that research does not test the ultimate question whether teachers form relative judgments about students compared to their peers within the same schools.

3.1.3 School and Teacher Attributes and ADHD Diagnoses

Schneider and Eisenberg (2006) is the only study (to my knowledge) that directly examines teacher and school characteristics as predictors of ADHD diagnoses. Schneider and Eisenberg find that having an older teacher increases the odds of diagnosis relative to having a younger teacher, and that having a white teacher decreases the odds of diagnosis relative to having a nonwhite teacher. Net of other factors, class size had no effect on the odds of diagnosis in that study. In their model, however, independent variables measured in the third-grade year were used to predict a diagnosis as of the third grade, so diagnosis in many cases preceded the measurement of the independent variables. As a result, the findings could represent the consequences of a diagnosis rather than the causes. For example, having a white teacher or an older teacher could be an artifact of having a special education placement; this seems like a probable assumption because special education teachers usually have advanced degrees or certifications. Thus, that study provides only limited support for the notion that the institutional features of schools play a role in predicting diagnosis.

3.2 Main Hypotheses

The current study extends previous work by looking more broadly at the contextual determinants of symptom recognition and response. In this study, the context includes both the longitudinal progression of socio-behavioral skills (and any medical response) and the school environment (both in terms of teacher and school attributes and school composition). I use a nationwide sample of kindergarten children, nested within schools, who were followed through the eighth grade. The advantage of the dataset for this project is that it has socio-behavioral evaluations from teachers and parents, taken at several points in time, that correspond to the specific symptoms that form the basis for a diagnosis of ADHD. I use these data, in connection with data about the student's background and school, to examine the correlates of symptom levels and ADHD diagnoses. In doing so, I close a gap from the previous chapter by examining the mediating effect of symptom levels on diagnosis. In addition, I provide a broader explanation of school effects – one that situates relative age effects in the context of school effects more generally.

Based on research that documents lower non-cognitive skills in children with low family SES or from racial minority groups (Hsin and Xie, 2012), I expect to find that children who are nonwhite or who are from low SES backgrounds will have higher symptom levels (both as reported by teachers and by parents and across grades in school) (H1). Furthermore, based on the research that documents relative-age effects in ADHD diagnoses and the underlying symptoms (Elder and Lubotsky, 2009; Elder, 2010; Evans et al., 2010; Zoëga et al., 2012b), I expect to find that the youngest students within the grade/school will have higher symptom levels (H2).

Existing research documents a low level of agreement between parent and teacher reports of ADHD symptoms (Wolraich et al., 2004). The lack of agreement could imply that ADHD is used as a social control mechanism (if teachers have higher symptom ratings than parents) or that parents desire the benefits of the ADHD label (if parents have higher symptom ratings than teachers). In Chapter 2, I identified different groups of diagnosed students based on their treatment regimens – high SES, white children (more likely to receive stimulants as performance enhancers) and low SES, minority group children (more likely to be controlled by anti-psychotic medications or to be placed in special education). The duality in treatments suggested that the diagnosis functions in different ways for different types of children, which, in turn, suggested that both social control and parental agency might be explanatory factors for children depending on their race and class position. Accordingly, I hypothesize that there will be greater levels of agreement among teachers and parents for white children than for minority group children (H3). This follows from the attribution of medical explanations for poor behavior or academic functioning when children come from higher status backgrounds, while alternative explanations are likely to be attributed to children from lower status backgrounds.[6]

At the same time, I hypothesize that, where there is disagreement, parent-rated symptom levels will be higher on average than teacher-rated symptom levels for white children, and parent-rated symptom levels will be lower on average than teacher-rated symptom levels for minority-group children (H4). Those effects, in turn, are likely to vary by symptom type; parents will be more likely to over estimate (relative to teachers) the symptom of inattention, and parents will be more likely to under estimate the symptom of impulsivity. The reason for this is the relation of inattention to academic domains and the fact that the attribution of academic difficulty to a medical problem is likely to be especially common among high SES parents of slow-developing children.

My next set of hypotheses relate to the consequences of parent-teacher agreement (or lack thereof) for diagnosis of children from different racial and class backgrounds. McLeod et al.'s (2007) data from the National Stigma Study-Children show that members of minority groups are less likely to know about the disorder and to believe that it is a real disease.[7] Thus, my hypothesis is that the reduced odds of diagnosis for black and Hispanic

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[6] The classic medical explanation that ties appearance of symptoms directly with treatment faces several obstacles even after teachers identify and label symptomatic behaviors as such. Parents face the additional challenge of recognizing and accepting their child's behaviors as problematic. Then, they must construct an interpretation that is medical and act upon it. For many parents, it might be difficult to differentiate between age-appropriate behaviors and those that are not. Moreover, different levels of agreement between parent and teacher ratings of ADHD symptoms might stem from different perceptions of the problem behavior by parents and teachers, medication effects, or actual observed differences in behavior (e.g., disruptive behaviors exhibited at home but not school).

[7] McLeod et al. (2007) found that just under two-thirds of respondents had heard of ADHD. Female respondents, white respondents, and respondents with higher levels of education were more likely to have heard of ADHD. Among respondents who had heard of ADHD, female respondents, white respondents,

children compared to white children (reported in Chapter 2) will persist even when I account for parent- and teacher-rated symptoms; if minority group children, on average, have worse health outcomes *and* reduced access to medical care compared to white children, they should have even lower odds of diagnosis after symptoms are netted out (H5). However, I expect to find that the reduced odds of diagnosis for children of higher SES are an artifact of having improved health outcomes (fewer symptoms), so I hypothesize that children with higher levels of SES will have increased odds of diagnosis net of symptoms (H6). If parent- and teacher-rated symptom levels have independent effects, the lack of teacher-parent agreement will reduce the odds of diagnosis. Accordingly, I consider whether there are race and class differences in the returns to parent-reported symptoms, net of teacher-reported symptoms. I hypothesize that parent over estimates of symptom levels (compared to teachers) will be more predictive of diagnosis for high SES children than for low SES children and for white children than for minority group children (H7). By implication, parents of high SES or white children will have greater agency and fewer resource constraints so that they can act on their children's symptoms even when teachers disagree.

My final hypotheses relate to the cognitive dimensions of ADHD. First, I expect the aggregate inattention and impulsivity levels to be lower as the aggregate socio-economic status of the children in a school increases; this follows from the inverse relationship between SES and non-cognitive skills at the individual level. Furthermore, if ADHD in fact represents a performance-enhancement strategy for high SES children, the aggregate socio-economic status of the children within a school should be a positive predictor of the likelihood of diagnosis (H8). Given the higher odds of diagnosis for high SES children, I expect that inattention is a stronger predictor of diagnosis than impulsivity for those students. Some corroboration for this comes from Leffers' (1997) qualitative study, which found that minority children were more likely to be identified with ADHD for unruly behavior while white middle class children were more often referred for evaluation for academic under-

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and respondents with higher incomes most often endorsed the belief that ADHD was a real disease.

achievement in addition to unruly behavior.

3.3 Data and Methods

The Early Childhood Longitudinal Study-Kindergarten cohort (ECLS-K), is a nationally representative sample of 21,400 kindergarteners who were tracked from kindergarten through eighth grade.[8] In the fall of 1998, NCES randomly sampled schools (the primary sampling units) from across the United States. Within each school, all kindergarten classrooms were selected, and children were randomly drawn from classrooms. Followup studies were conducted the spring of the years 1999, 2000, 2002, 2004, and 2007.[9]

As part of the study, the NCES submitted questionnaires to each child's parents, teachers, and school administrators. I used several questions from the parent questionnaires (in 1998, 2000, 2002, 2004, and 2007) to construct the ADHD diagnosis measure. The first stem question was: "Does {Child} pay attention ... (1) Better than children {his/her} age, (2) As well as other children, (3) Slightly less well than other children, or (4) Much less well than other children." If the child has problems with paying attention [3 or 4], the parent was asked: "Has {Child} been evaluated by a professional in response to {his/her} ability to pay attention or learn?" If the parent answered yes, the parent then was asked: "Did you obtain a diagnosis of a problem from a professional?" Again, if the answer was yes, the parent was asked: "What was the primary diagnosis." The response categories for the question included the items "attention deficit disorder" and "attention deficit hyperactive disorder." The series of questions is then repeated for the child's "overall activity level." In this case, "hyperactivity" is included as an additional response category. Using those questions, I created a binary variable for ADHD diagnosis (coded 1 if the child is re-

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[8] All sample sizes are rounded to the nearest 10 pursuant to the NCES restrictive data use agreement.

[9] A freshening process occurred in the springs of kindergarten and first grade, when a subset of movers were followed to their new schools. The remaining movers were replaced by a new sample of students from the original schools. The freshening process was discontinued after the first grade, resulting in sample attrition as children moved to new schools.

ported to have a diagnosis of hyperactivity, attention deficit disorder, or attention deficit hyperactivity disorder). In the final three waves, there were additional stem questions that used attention disorders as response categories. For those years, all relevant stem questions were included in constructing the binary measures.

The parent and teacher questionnaires include contemporaneous reports of the child's sociobehavioral skills that I use as a proxy for symptoms. In the fall and spring semesters of kindergarten, teachers were asked to rate individual students on different dimensions measuring social, emotional, and cognitive development. Those questionnaires were repeated in the spring of first, third, and fifth grade. Parents also provided similar assessments in the fall and spring of kindergarten and in the spring of first grade, reflecting behavior in the home. The items are adapted from the Social Skills Rating System (SSRS) developed by Gresham and Elliott (1990),[10] which is a norm-referenced instrument designed to identify social competence and adaptive behavior in children across three domains – social skills, problem behaviors, and academic competence (Tourangeau et al., 2006). Among other things, teachers were asked whether the child "pays attention well" or "acts impulsively." Parents were asked how often the child "acts impulsively," "concentrates on a task and ignores distractions," or is "hyperactive." The items are rated on a scale of 1 (never) to 4 (very often), which I invert, as necessary, so that higher values represent higher symptom levels. I standardize each parent and teacher measure separately so that the resulting variable has a mean of 0 and a standard deviation of 1. This allows me to compare the magnitude of the symptoms represented by those variables across raters and years.

I used the teacher questionnaire to obtain the age, gender, and race of the child's teacher. The school administrator questionnaire indicates the school's public/private status, class size, school size, location information (whether urban, suburban or rural, and whether lo-

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[10] Copyright © 1990 NCS Pearson, Inc. Used with permission. All rights reserved. "SSRS is a trademark, in the US and/or other countries, of Pearson Education, Inc. or its affiliate(s).

cated in the south), and the share of the student body that is a racial minority. To obtain school SES, I fit school random effects models that predict individual SES from the urbanicity, region, school type, school percent minority, and reading and math IRT scores. I then use an average of the predictions for the students within each school along with the random component.[11]

The regression models in this chapter control for variables that have been associated in previous research with students' academic and social and behavioral skills. These variables include race (coded black, white, Hispanic, Asian, or other), gender, socioeconomic status,[12] single parent status, insurance status, whether a student has been retained or has chosen to "red shirt," as well as age as of September 1 of the survey year (all obtained from the parent questionnaire). Low birthweight is taken from the parent questionnaire and defined as birth weight under 5 pounds.

Of the approximately 21,400 students in the dataset, I excluded about 2240 from the sample to fulfill various research goals. In brief, I excluded the children who were not first-time kindergarteners in the fall of 1998, the children who were already enrolled in non-mainstream special education schools, and those whose parents reported a prior evaluation for behavioral or learning problems. To explain the school-related factors contributing to diagnosis, it was necessary to start with a sample of children who did not experience serious academic or behavioral issues before starting kindergarten; otherwise, I cannot account for reverse causation running from diagnosis to the reporting of socio-behavioral skills. About 5 percent of the entire dataset had a prior evaluation for behavioral or learning problems. About 4 percent of the dataset constituted children who were repeating kinder-

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[11] To address the problem that some schools have a small number of students, I use empirical Bayes estimates from multilevel models. This approach relies on "shrinkage" estimates that are a weighted sum of the estimates from a single school and the estimates predicted for that school by data for the larger population. The basic idea is that estimates for schools with a large number of students put more weight on the school-specific estimate, while estimates for schools with a small number of students put more weight on the overall estimate pulling it more strongly towards the overall mean.

[12] The socioeconomic (SES) index is comprised of five variables: family income, the parents' highest levels of educational attainment, and the parents' occupational prestige rankings. The index is normalized to have a mean of zero and standard deviation equal to one.

garten; children who were white and from high SES backgrounds were less likely to be repeating the grade. About 3 percent of the dataset represented children already in special education schools. Because of overlap, those restrictions amounted to about 10 percent of the dataset, which likely excludes the children with the most severe symptoms.[13]

3.4 Results

3.4.1 Individual Level Patterns

Parent-reported ADHD incidence increased as the children in the study progressed from kindergarten through the eighth grade. As of the spring of the first grade, about 1 percent of the first-time kindergarteners in the sample had an ADHD diagnosis. By third grade, about 3.5 percent of the children had reported a diagnosis in at least one survey year, and by 5th grade, about 5 percent of the children had reported a diagnosis in at least one survey year (Figure 3.4.1). Medication use among those diagnosed with the disorder decreased from about 57 percent in first grade to about 40 percent in eighth grade. Special education enrollment conditional upon diagnosis increased from about 15 percent of the children in first grade to about 30 percent of those diagnosed as of fifth grade. Most of the children with IEPs (more than 80 percent in third grade) were placed in general education environments. In first grade, most of the students diagnosed with ADHD who had an IEP were in the speech-impaired category or the learning disabilities category; by the third grade, most of the children were in the learning disabilities category. In Chapter 4, I return to this topic when I examine parent and school disputes about the appropriate eligibility category for students with ADHD.

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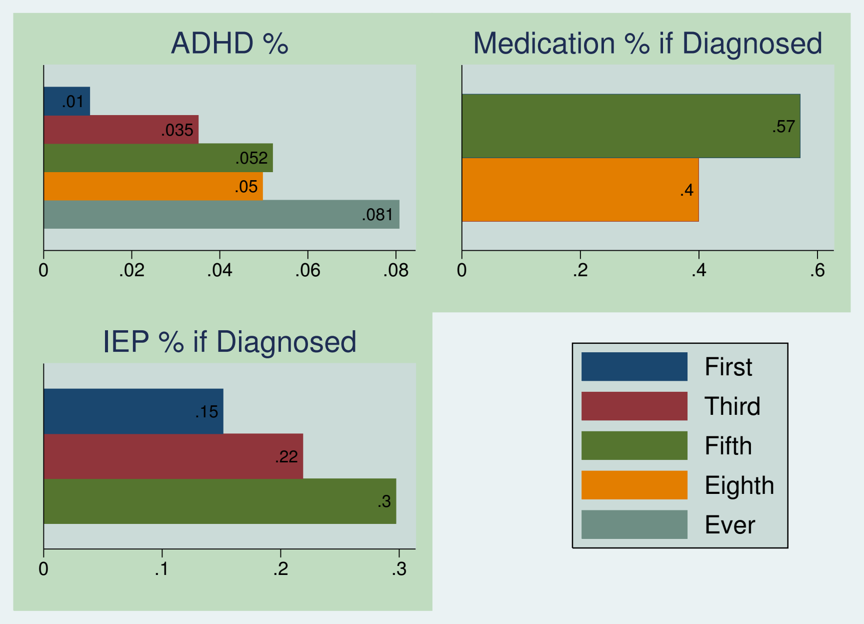
[13] It also should be noted that about 7 percent of the children in the full sample were “redshirted” (meaning that they started kindergarten the year after they were initially eligible). Children who were white, or from high SES backgrounds, were more likely to be in that group. Those children remain in the dataset.

Figure 3.4.1: ADHD Prevalence, Drug Use, and IEP Placement, by Grade. Source 1998-99 ECLS-K.

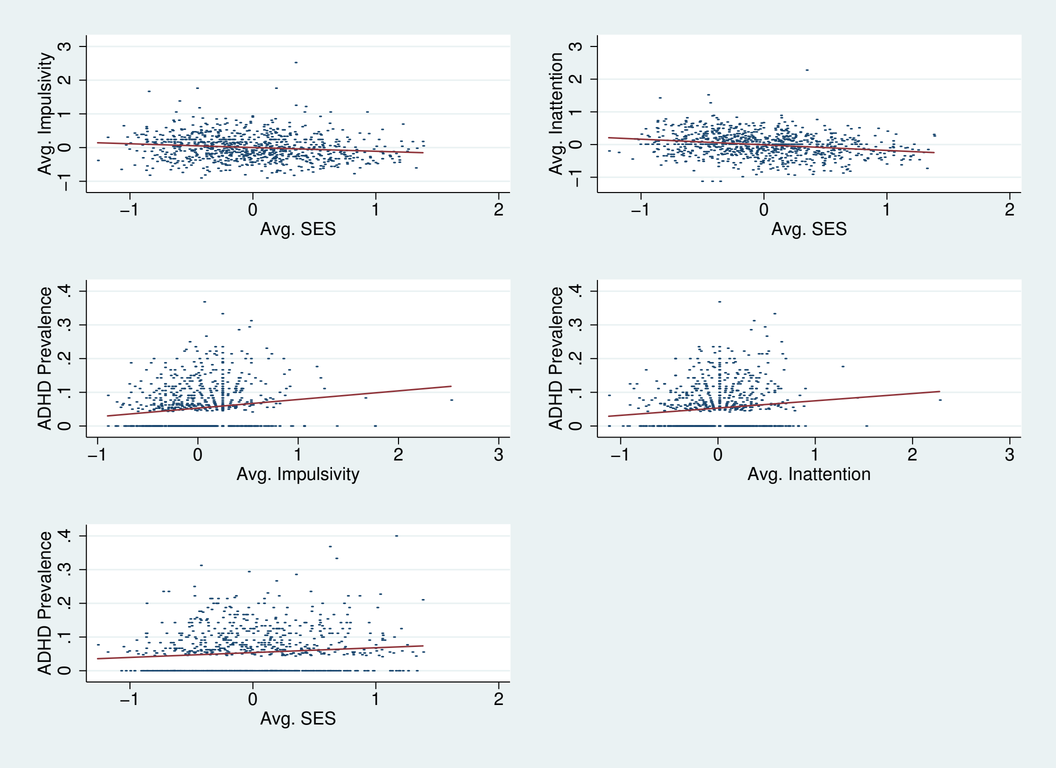


Note: Sample excludes children with a prior evaluation for attention or behavioral problems, prior special education placement, or who had been retained in kindergarten. In the excluded the group, approximately 11 percent had been diagnosed with ADHD. Because the treatment questions were not asked in all waves, I do not have the same number of bars for each subfigure.

3.4.2 School Level Patterns

Of the approximately 1020 schools, about 380 do not have a child in this dataset that received a diagnosis by the eighth grade. The number of diagnoses ranges from 1 to 7 for the remaining schools. At the school level, there are negative relationships between average socioeconomic status and teacher-reported impulsivity and between average socioeconomic status and teacher-reported inattention. Conversely, there are positive relationships between teacher-reported inattention and ADHD prevalence and between teacher-reported impulsivity and ADHD prevalence (Figure 3.4.2). The result of those offsetting patterns is a slight yet significantly positive relationship between school prevalence of ADHD and school average socioeconomic status, which is consistent with both a compositional effect – high SES students are more likely to be in schools with other high SES students and are more likely to have ADHD – and a normative effect – high SES schools demand better attention or behavior.

Figure 3.4.2: Scatterplots Depicting Relationships Among SES, ADHD Prevalence, and Sociobehavioral Skills at School Level



Socio-demographic Determinants of Symptoms

Having established that there is higher prevalence of ADHD in higher SES schools – despite the lower aggregate levels of symptoms – my next step is to estimate models that regress individual symptom levels on race, gender, socio-economic status, and relative age within school. I estimate separate models for each symptom subtype (inattention and impulsivity), each rater (parent and teacher), and for different stages in the early elementary years (kindergarten and first grade).[14] Tables 3.1 and 3.2 contains the results for the inat-

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[14] This analysis is based on kindergarten and first grade ratings because parent ratings were not obtained after the first-grade wave. I do not use hyperactivity ratings, because teachers were not asked about hyperactive behaviors.

tention and impulsivity models, respectively.[15]

Table 3.1 suggests that parent- and teacher-reported inattention levels both increase, on average, between kindergarten and first grade, consistent with the increased academic demands placed on children in the first grade. Parent and teacher ratings for inattention are of roughly the same magnitude for white students in kindergarten and first grade. Black students had higher symptom levels than white students in both waves and across both raters net of SES and age (H1); however, the average black-white race gap in inattention was larger in kindergarten for both raters, and the black-white race gap was larger in the teacher ratings than in the corresponding parent ratings for both years. Those findings suggest that teachers are more likely than parents to observe racial differences in attention skills, and they suggest that parents of black students are more likely to underestimate inattention levels, while parents of white students are more likely to overestimate inattention levels (H4). Inattention levels also vary by socio-economic status, with higher levels of inattention among poorer students (H1); the magnitudes of the SES differences are fairly uniform across raters, but the SES gaps grow somewhat larger in the first grade compared to kindergarten (as academic demands increase). Inattention levels also vary with the child's age relative to other kindergarteners in the same school; the oldest children in a school experience lower symptom levels across raters and years (H2). However, relative age effects are much larger in magnitude in the teacher ratings than in the corresponding parent ratings, which is expected because parents are less likely to be in a position to make comparisons across students within a school. At the same time, relative age effects do not decline significantly between kindergarten and first grade, contrary to the relative immaturity suggestion in the literature. Models that regress third- and fifth-grade inattention levels on relative age and other covariates suggest that relative age effects on teacher-reported inattention levels persist throughout the elementary years.

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[15] I conducted separate analyses that use the externalizing behavior and approaches to learning scales as alternative measures of symptoms; impulsivity and inattention are included as items within those factors. Those analyses are available upon request.

Table 3.1: Regression of Teacher- and Parent-Rated Inattention Based on Socio-Demographic Factors

	Teacher Rated				Parent Rated			
	K		1st		K		1st	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Race (white)								
Black	0.221***	(0.0280)	0.216***	(0.0291)	0.162***	(0.0289)	0.0834**	(0.0305)
Hispanic	0.0672**	(0.0258)	-0.0101	(0.0269)	-0.0279	(0.0266)	-0.0349	(0.0278)
Asian	-0.00410	(0.0387)	-0.214***	(0.0408)	0.00576	(0.0404)	-0.0412	(0.0440)
Other	0.176***	(0.0390)	0.0946*	(0.0404)	0.0948*	(0.0403)	0.110**	(0.0417)
Male	0.377***	(0.0176)	0.395***	(0.0182)	0.112***	(0.0181)	0.156***	(0.0188)
School age (1st quartile, youngest)								
Second quartile	-0.168***	(0.0236)	-0.162***	(0.0245)	-0.0303	(0.0244)	-0.0552*	(0.0252)
Third quartile	-0.273***	(0.0233)	-0.228***	(0.0242)	-0.0360	(0.0240)	-0.108***	(0.0248)
Fourth (oldest) quartile	-0.326***	(0.0259)	-0.348***	(0.0267)	-0.0969***	(0.0267)	-0.102***	(0.0276)
SES Category (1st quintile, poorest)								
Second quintile	-0.162***	(0.0304)	-0.125***	(0.0318)	-0.0938**	(0.0313)	-0.0850*	(0.0332)
Third quintile	-0.226***	(0.0303)	-0.192***	(0.0317)	-0.134***	(0.0312)	-0.171***	(0.0331)
Fourth quintile	-0.284***	(0.0304)	-0.311***	(0.0317)	-0.248***	(0.0313)	-0.253***	(0.0330)
Fifth quintile	-0.435***	(0.0307)	-0.447***	(0.0320)	-0.446***	(0.0316)	-0.451***	(0.0333)
Constant	0.112***	(0.0306)	0.161***	(0.0320)	0.143***	(0.0315)	0.175***	(0.0333)
Number of observations	11560		10920		11720		10840	

* $p<0.05$ ** $p<0.01$ *** $p<0.001$

Table 3.2: Regression of Teacher- and Parent-Rated Impulsivity Based on Socio-Demographic Factors

	Teacher Rating				Parent Rating			
	K		1st		K		1st	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Race (white)								
Black	0.164***	(0.0285)	0.217***	(0.0295)	-0.0795**	(0.0289)	-0.0392	(0.0306)
Hispanic	-0.0434	(0.0263)	-0.0987***	(0.0274)	-0.263***	(0.0266)	-0.255***	(0.0279)
Asian	-0.201***	(0.0395)	-0.184***	(0.0415)	-0.227***	(0.0406)	-0.265***	(0.0445)
Other	0.0617	(0.0397)	0.0688	(0.0409)	-0.0252	(0.0403)	-0.0420	(0.0419)
Male	0.384***	(0.0179)	0.452***	(0.0185)	0.0985***	(0.0181)	0.0850***	(0.0189)
School age (1st quartile, youngest)								
Second quartile	-0.105***	(0.0240)	-0.103***	(0.0248)	-0.00497	(0.0244)	-0.0236	(0.0253)
Third quartile	-0.0969***	(0.0237)	-0.0996***	(0.0246)	-0.0222	(0.0240)	-0.0493*	(0.0250)
Fourth (oldest) quartile	-0.111***	(0.0263)	-0.144***	(0.0271)	-0.0285	(0.0267)	-0.0327	(0.0277)
SES Category (1st quintile, poorest)								
Second quintile	0.00599	(0.0310)	0.00959	(0.0323)	0.0126	(0.0314)	-0.0150	(0.0335)
Third quintile	0.000917	(0.0309)	-0.0659*	(0.0322)	0.00832	(0.0312)	-0.0393	(0.0333)
Fourth quintile	-0.0333	(0.0310)	-0.118***	(0.0322)	-0.0116	(0.0313)	-0.0286	(0.0332)
Fifth quintile	-0.104***	(0.0312)	-0.186***	(0.0325)	-0.0670*	(0.0317)	-0.0743*	(0.0335)
Constant	-0.139***	(0.0312)	-0.0901**	(0.0325)	0.0364	(0.0316)	0.0696*	(0.0335)
Number of observations	11410		10850		11690		10810	

* $p<0.05$ ** $p<0.01$ *** $p<0.001$

Table 3.2 shows that teacher- and parent-reported impulsivity levels increase slightly between kindergarten and the first grade, suggesting that the demands on behavior are higher in first grade. Black students had higher teacher ratings for impulsivity than white students in both waves (H1), and the race gaps were larger in first grade than in kindergarten. However, the black-white race gap was negative or insignificant in the parent ratings. These findings suggest that parents of black students are more likely to underestimate impulsivity levels, while parents of white students are more likely to overestimate inattention levels (H4). Impulsivity levels are slightly smaller in the higher SES quintiles than in the lower quintiles, particularly in the first grade (H1). Teacher-rated impulsivity levels vary with the child's age relative to other students in the same school, but to a lesser degree than the differences in inattention (H2). Finally, teacher ratings of the impulsivity levels of white students were lower than the comparable parent ratings. Parents of white children might experience less stigma than parents of black children in the admission that their children are impulsive; at the same time, teachers might be less likely to view behavior through a lens of impulsivity when children are white.

Next, I estimate separate models that isolate parent- and teacher-rating correspondence across groups of children. Table 3.3 displays coefficients from regressions of teacher-rated skills – either inattention or impulsivity – on the corresponding parent-rated skill, along with race, gender, and socioeconomic status controls, and their interactions with the parent-rated skill. The coefficient for the parent-rated skill represents the relationship to the corresponding teacher rating for white boys in the lowest SES quintile. The coefficients for the interaction terms represent the extent to which parent- and teacher-ratings are correlated more or less closely for other groups.

As shown in Table 3.3, the correlation between parent and teacher ratings is low, particularly in kindergarten where a one standard deviation increase in parent-reported impulsivity is associated with one-tenth of a standard deviation increase in teacher-reported impulsivity. The correlation is somewhat higher in first grade (compared to kindergarten)

Table 3.3: Regression of Teacher-Rated Symptom Levels on Parent Ratings, Socio-demographic Measures, and Their Interactions

	Inattention				Impulsivity			
	K		1st		K		1st	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Parent rating	0.146***	(0.0146)	0.213***	(0.0151)	0.0981***	(0.0152)	0.142***	(0.0161)
Male x PR	-0.0125	(0.0175)	0.0141	(0.0187)	0.0572**	(0.0181)	0.0673***	(0.0192)
Black x PR	-0.0188	(0.0264)	-0.0696*	(0.0280)	-0.0340	(0.0268)	-0.0138	(0.0284)
Hispanic x PR	-0.0687**	(0.0241)	-0.0480	(0.0260)	-0.0119	(0.0250)	-0.0606*	(0.0268)
Asian x PR	-0.127**	(0.0390)	-0.182***	(0.0437)	-0.0668	(0.0407)	-0.0851	(0.0465)
Other x PR	0.0448	(0.0402)	-0.000494	(0.0425)	0.0174	(0.0406)	-0.102*	(0.0409)

Base effects included in estimation but not shown

* $p<0.05$ ** $p<0.01$ *** $p<0.001$

and for inattention (compared to impulsivity). The difference in correlation across grades suggests that parents obtain a better understanding of their child's school performance during the kindergarten year, which is represented in their ratings in the first grade. With respect to race and ethnicity, the models confirm that there is lower correlation between parent and teacher ratings for black children than for white children in the inattention domain during the first grade (H3). There is also lower correlation for Asian children than for white children in teacher- and parent-reported inattention ratings, because parents over-estimate inattention levels relative to teachers. There is significantly higher correlation for boys' impulsivity ratings than for girls' impulsivity ratings. One likely explanation for this difference is that boy behaviors are seen by parents and teachers as typical of ADHD. This finding indicates a process of looping; when symptoms occur, there is more likely to be agreement among caretakers. An understanding of the category thus becomes part of a "self-fulfilling prophecy," explaining the higher ADHD prevalence among boys. Further support for this finding comes from evidence that the gender differences in symptom levels are not present when adolescents serve as the informants (Leren, 2008).

Next, given the positive relationship between ADHD prevalence and school SES, I estimate models that predict whether ADHD symptoms in schools (evidenced by teacher-reported ratings) also vary by school SES. Table 3.4 displays the results.

As shown in Table 3.4, school SES is associated with higher levels of teacher reported-inattention, reversing the school-level pattern shown in Figure 3.4.2. That finding could imply that students in high SES schools have higher symptom levels in some absolute sense, or it could imply that the demands on attention are greater in high-SES schools. The latter implication makes more sense, because of the inverse relationship between individual SES levels and teacher-reported inattention. In other words, controlling for individual SES reverses the negative correlation between inattention and school SES that was displayed in Figure 3.4.2. It also is worth noting that there is no significant relationship between school SES and average impulsivity levels, suggesting that demands for behavioral

Table 3.4: Regression of Teacher-Rated Symptom Levels On Parent Ratings and School SES (First Grade)

	Inattention		Impulsivity	
	Coef.	S.E.	Coef.	S.E.
Parent rating	0.192***	(0.00951)	0.154***	(0.00971)
Student SES	-0.205***	(0.0160)	-0.0897***	(0.0163)
School SES	0.120***	(0.0258)	-0.0270	(0.0264)
School age (1st quartile, youngest)				
Second quartile	-0.140***	(0.0249)	-0.0944***	(0.0255)
Third quartile	-0.197***	(0.0247)	-0.0883***	(0.0253)
Fourth (oldest) quartile	-0.330***	(0.0272)	-0.139***	(0.0279)
Race (white)				
Black	0.224***	(0.0310)	0.205***	(0.0319)
Hispanic	0.0250	(0.0278)	-0.0795**	(0.0287)
Asian	-0.216***	(0.0441)	-0.119**	(0.0457)
Other	0.0942*	(0.0420)	0.0678	(0.0431)
Male	0.381***	(0.0186)	0.447***	(0.0190)
Constant	-0.0941***	(0.0204)	-0.177***	(0.0209)
Number of observations	10020		9940	

* $p<0.05$ ** $p<0.01$ *** $p<0.001$

conformity do not vary systematically with school SES.

To recapitulate, there is more variation across socio-demographic groups in inattention symptoms than in impulsivity symptoms. Although parent-rated inattention levels only weakly correlate with corresponding teacher ratings, the parents of white children over- and under-estimate inattention levels to roughly the same extent. By contrast, the parents of Asian students over-estimate inattention levels (relative to teachers), and the parents of black students generally under-estimate inattention and impulsivity levels (relative to teachers). Finally, individual SES is negatively related to teacher ratings for inattention (as predicted), but school SES is positively related to teacher ratings for inattention (controlling for individual SES). With that background, I now examine the individual- and school-level determinants of diagnosis.

3.4.3 Importance of Teacher- and Parent-Ratings for Diagnosis

Because the datasets that I used in Chapter 2 did not have a longitudinal structure or a measure of symptom levels, that chapter was not able to address the question I turn to to now: whether differences in the effects of race and SES on the likelihood of diagnosis are affected by the severity of the symptoms. I start by replicating the model from Chapter 2 (with ECLS-K data) and placing that model alongside a specification that accounts for symptoms. Table 3.5 shows odds ratios from two logistic regression models – the first predicts the odds that a child has an ADHD diagnosis based on race, class, whether the child is insured, and whether the child is in a single-parent family (comparable to Table 2.1 (Model 1)), and the second adds controls for teacher- and parent-reported symptoms to ascertain whether race- and class-based differences in diagnosis are explained by race- or class-based differences in symptoms. I estimate the model for students whose diagnosis is first reported in the first-grade wave and then for students whose diagnosis is first reported in the third grade wave. I use the symptom levels from the previous wave to predict diagnosis in the wave in question.

The odds ratios in Model 1 are similar to those in Table 2.1 (Model 1). Black and Hispanic children have lower odds of diagnosis than white children, and there are lower odds of diagnosis at higher levels of SES. However, Model 2 shows that the symptoms of kindergarten children are strongly predictive of being diagnosed before the spring of first grade. With those controls, the odds ratios for the minority race variables decrease – suggesting that children from racial minority groups have even lower odds of being diagnosed after accounting for sociobehavioral skills (H5). I have already shown that white children, on average, have lower symptom levels than black and Hispanic children, especially as measured by teacher ratings. Symptom levels also explain a significant portion of the gender differences in the likelihood of diagnosis. However, the SES variables change direction (and lose significance): controlling for sociobehavioral skills, children with higher levels of SES have increased (or equivalent) odds of being diagnosed (H6). This finding is consistent with the

Table 3.5: Logistic Regression of ADHD Diagnosis On Race, Income Level, and Symptom Levels

	First Grade				Third Grade			
	(1)		(2)		(3)		(4)	
	Odds Ratio	Std.Err.	Odds Ratio	Std.Err.	Odds Ratio	Std.Err.	Odds Ratio	Std.Err.
Teacher-impulsive (prior wave)			1.526***	(0.142)			1.223**	(0.0881)
Teacher-inattentive (prior wave)			1.924***	(0.251)			2.278***	(0.227)
Parent-hyperactive (prior wave)			1.721***	(0.160)			1.353***	(0.111)
Parent-impulsive (prior wave)			1.069	(0.0913)			1.302**	(0.106)
Parent-inattentive (prior wave)			1.260	(0.151)			1.465***	(0.149)
Race (white)								
Black	0.385**	(0.120)	0.252***	(0.0873)	0.519*	(0.144)	0.405**	(0.124)
Hispanic	0.384**	(0.125)	0.369**	(0.124)	0.360***	(0.0957)	0.211***	(0.0808)
Asian								
Other	0.504	(0.207)	0.416*	(0.174)	0.991	(0.306)	0.748	(0.275)
Male	2.720***	(0.539)	1.585*	(0.346)	2.604***	(0.414)	1.517*	(0.278)
SES (1st quintile ref)								
2nd quintile	1.184	(0.335)	1.611	(0.476)	1.092	(0.308)	1.623	(0.547)
3rd quintile	0.947	(0.276)	1.509	(0.468)	0.742	(0.229)	1.139	(0.412)
4th quintile	0.652	(0.218)	1.225	(0.408)	0.768	(0.234)	1.670	(0.598)
5th quintile	0.399*	(0.142)	0.997	(0.366)	0.874	(0.264)	2.272*	(0.818)
Redshirted	1.005	(0.331)	0.997	(0.340)	1.073	(0.287)	1.097	(0.325)
Single parent family	1.984***	(0.395)	1.596*	(0.327)	1.237	(0.235)	0.988	(0.209)
Insured	1.342	(0.464)	1.572	(0.570)	1.598	(0.550)	1.957	(0.836)
Number of observations	10230		9840		8510		7670	

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

idea that the diagnosis has a “performance enhancement” function for high SES students. At the same time, the findings are consistent with the limited access explanation for poor and racial minority group children. Furthermore, the findings demonstrate the independent importance of each of the parent- and teacher-symptoms; the higher odds ratio for teacher-rated inattention suggests that it is the symptom that is the strongest predictor of diagnosis. The models predicting diagnosis during the period beginning in the spring of first grade and ending in the spring of third grade based on first-grade symptoms (Models 3 and 4) reveal similar patterns.[16] The increased importance of parent-reported symptoms (comparing third grade to the first grade) is apparent, and teacher-rated inattention becomes an even stronger predictor of diagnosis in the later wave.

Next, I estimate differences in the returns to parent-rated inattention and impulsivity by race. The dependent variable is whether the child’s parents ever reported an ADHD diagnosis, conditional upon being undiagnosed and at grade level during the first grade wave. The independent variables are the teacher ratings for impulsivity and inattention, the difference between parent and teacher ratings for impulsivity and inattention, race, gender, socio-economic status, relative age quartiles, and the interaction of the differenced ratings and race and gender. The results are shown in Table 3.6.

Table 3.6 confirms that white students receive significant returns for diagnosis to parent ratings of inattention and impulsivity independent of the teacher ratings. However, black students receive significantly lower returns to parent-reported inattention, and are significantly less likely than white students to be diagnosed even net of the parent-reported over-estimate of inattention (H7). To put it differently, if I re-estimate this model using only white students and then assign black students the white returns to the coefficients, the probability of diagnosis for black students would nearly double.

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[16] Additional models (not shown) that predict diagnosis from spring of third grade through eighth grade produce comparable results.

Table 3.6: Logistic Regression of ADHD Diagnosis On Parent Over-Estimates of Symptom Levels

	Odds Ratio	S.E.
Teacher-rated inattention	2.896***	(0.221)
Teacher-rated impulsivity	1.759***	(0.109)
Inattention difference (P-T)	1.523***	(0.136)
Impulsivity difference (P-T)	1.428***	(0.102)
Race (white)		
Black	0.425***	(0.0827)
Hispanic	0.469***	(0.0855)
Asian	0.0543**	(0.0526)
Other	0.889	(0.184)
Male	1.729***	(0.191)
Black x Impulsivity difference	1.001	(0.103)
Hispanic x Impulsivity difference	1.034	(0.121)
Asian x Impulsivity difference	0.719	(0.386)
Other race x Impulsivity difference	1.157	(0.165)
Male x Impulsivity difference	0.949	(0.0718)
Black x Inattention difference	0.741*	(0.101)
Hispanic x Inattention difference	0.987	(0.142)
Asian x Inattention difference	0.642	(0.436)
Other race x Inattention difference	1.172	(0.209)
Male x Inattention difference	0.995	(0.0908)
SES	1.210**	(0.0822)
N	10970	

* $p<0.05$ ** $p<0.01$ *** $p<0.001$

3.4.4 The Importance of School Effects

Turning to the relevance of the school context, in the next model I estimate the returns to school-level factors for ADHD diagnosis. The dependent variable is whether a child – undiagnosed as of first grade – is diagnosed at any time through the eighth grade. I start with the individual-level predictors in the previous model, and I add school SES, gender, age, and race of the child's first-grade teacher, the type of school (with public as the reference category), class size, and the child's relative age position in the school. The results are found in Table 3.7.

Most of the first-grade teacher and school attributes have no significant relationship to diagnosis in later grades. Children in larger first-grade classes have lower odds of receiving a diagnosis, which is consistent with the idea that children in larger classes are less likely to be identified as needing intervention, but it cuts against the idea that children in larger classes receive less individualized attention (necessitating medical intervention). The most important finding is that school SES has a positive effect on diagnosis, which is consistent with the higher levels of inattention (net of individual SES) – and, by inference, the higher normative demands for attention – in those schools (H8). The model also suggests that relative-age effects (i.e., the greater level of symptoms for those who are younger than their classmates) extend to the likelihood of diagnosis even after accounting for symptom levels.[17]

3.4.5 Relative Symptom Levels

One final (and consequential) way to think about the school context is to look directly at relative symptom levels for children within the same school. Table 3.8 shows odds ratios from a set of models that predict whether a child has an ADHD diagnosis at any time through the eighth grade, based on the compositional effects attributable to contagion or

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[17] When I restrict the analysis to those who are first diagnosed as of the first, third, fifth grade, or eighth grades, the relative age effects are confined to the third grade model.

Table 3.7: Logistic Regression of ADHD Diagnosis On School and Teacher Attributes

	Odds Ratio	S.E.
Teacher-rated inattention	2.917***	(0.260)
Teacher-rated impulsivity	1.720***	(0.124)
Inattention difference (P-T)	1.497***	(0.155)
Impulsivity difference (P-T)	1.409***	(0.117)
Race (white)		
Black	0.478**	(0.121)
Hispanic	0.493**	(0.112)
Asian	0.0479*	(0.0573)
Other	0.941	(0.225)
Male	1.923***	(0.247)
Black x Impulsivity difference	0.981	(0.121)
Hispanic x Impulsivity difference	0.937	(0.136)
Asian x Impulsivity difference	0.636	(0.497)
Other race x Impulsivity difference	1.119	(0.175)
Male x Impulsivity difference	0.961	(0.0837)
Black x Inattention difference	0.711*	(0.118)
Hispanic x Inattention difference	1.080	(0.189)
Asian x Inattention difference	1.091	(0.982)
Other race x Inattention difference	0.970	(0.199)
Male x Inattention difference	1.034	(0.110)
School age (1st quartile)		
Second quartile	0.873	(0.125)
Third quartile	0.665**	(0.102)
Fourth (oldest) quartile	0.620*	(0.117)
SES	1.133	(0.114)
Redshirted	1.159	(0.282)
Low birthweight	1.439	(0.324)
Single parent	0.937	(0.143)
Class size	0.971*	(0.0137)
Male teacher	0.355	(0.215)
Teacher age (under 35)		
Between 35 and 49	1.129	(0.155)
Over 50	1.051	(0.150)
Teacher race (white)		
Black	0.975	(0.279)
Hispanic	1.408	(0.492)
School type (public)		
Catholic	1.056	(0.186)
Other religious	0.727	(0.182)
Other private	0.483	(0.236)
School SES	1.458*	(0.254)
N	8410	

* $p<0.05$ ** $p<0.01$ *** $p<0.001$

peer effects (separating those attributable to aggregate characteristics of the students in a school) and relative position effects. The specification is in the form:

$$logit(Y_{ij}) = \beta_0 + \beta_1(X_{ij} - \bar{X}) + \beta_2\bar{X}_j + \gamma' Z + e_{ij} + u_j \qquad (3.4.1)$$

where Y_{ij} denotes the student i in school j has a diagnosis, $(X_{ij} - \bar{X}_j)$ represents the vector of school-centered individual sociobehavioral ratings for impulsivity and attentiveness, $\bar{X}_j$ represents the vector of school-average sociobehavioral rating for impulsivity and attentiveness, and $\gamma' Z$ is the vector of regression coefficients and corresponding matrix of explanatory variables. The error term varying between students within a school is denoted by e_{ij}, and the error term u_j varies between schools.

The school-centered variables target the differentiation of students within the school – specifically, the degree to which the relative position of students within the school affects the likelihood of a diagnosis when controlling for the average sociobehavioral skills of students within the school (Raudenbush and Bryk, 2001). Positive estimates for the effect of these variables (β_1) indicate that as the relative levels of symptoms of students within the school increases, so does their predicted likelihood of diagnosis. As specified in equation 3.4.1, the estimate β_2 includes both the compositional and aggregate effects of the individual sociobehavioral skills; in other words, the model does not control for the uncentered individual sociobehavioral skills. To isolate the compositional effect, I net out the aggregate of students' sociobehavioral skills by subtracting the corresponding β_1 from β_2 and then bootstrapping for the standard errors of the differences between the groups of coefficients (Raudenbush and Bryk, 2001). Positive estimates for this difference would suggest that students are more likely to be diagnosed as symptom levels in a school increase, regardless of the students' relative positions. Table 3.8 contains the results.

As shown in Table 3.8, a deviation from the school mean for teacher-reported impulsivity is a significant predictor of an ADHD diagnosis. However, the behavioral climate

Table 3.8: Logistic Regression of ADHD Diagnosis On Relative Symptoms

Variable	Coef.	Std. Err.
School avg teacher-rated impulsivity	0.402**	(0.156)
Child deviation for teacher-rated impulsivity	0.380***	(0.0488)
School avg teacher-rated inattention	0.367*	(0.168)
Child deviation for teacher-rated inattention	0.766***	(0.0612)
Impulsivity coefficients differenced	0.0224	(0.161)
Inattentiveness coefficients differenced	-0.399*	(0.173)

Covariates included in estimation but not shown

* $p<0.05$ ** $p<0.01$ *** $p<0.001$

(measured by the differencing of the impulsivity coefficients) does not significantly affect the likelihood of diagnosis. A deviation from the school mean for inattention is an even stronger predictor of diagnosis, contradicting the social control explanation for ADHD. The attention culture does relate to the likelihood of diagnosis: higher levels of inattention in a school are associated with a lower likelihood of diagnosis, net of relative inattention levels. Put differently, students in schools with higher levels of attentiveness face higher expectations, which leads to higher prevalence. My earlier explanation was that school SES is related to an increased inattention score (net of individual SES), and that this explains the higher rate of diagnosis. In this model, I separately identify school SES, individual SES, relative position, and average symptom levels, and I find that SES, and school SES are no longer significant when the average level of inattention in schools is included in the model (H8). The relative inattention position of a child within a school is the strongest overall predictor of diagnosis (net of other factors). The difference between the inattention and impulsivity trajectories is consistent with the idea that inattention represents a high status route of enhancement.

3.5 Conclusion

In this chapter, I used longitudinal data to examine pathways to diagnosis and variations across schools. The chapter makes three contributions. The main contribution is to show that schools contribute to the differential evaluation of children's attention skills and that those differences influence ADHD prevalence. ADHD is (in practice) a cognitive disorder that responds to poor attention levels. Inattention problems are heightened in schools where the normative demands on attention are high. As a result, ADHD prevalence is somewhat higher in schools with higher average SES levels; however, the relative positioning of one's symptoms within a school is the primary driver of diagnosis. Furthermore, this chapter shows how pathways to diagnosis vary for children from different racial and ethnic groups. Black students are less likely to be diagnosed in part because the parent ratings of symptom levels are lower than the comparable teacher ratings, and even when the parent ratings are high, the likelihood of diagnosis for black students is less responsive to parent-reported inattention levels than for white students. Finally, this chapter shows that relative age effects on diagnosis run primarily through teacher assessments of inattention (not impulsivity) and that they in fact represent comparative judgments by teachers within schools (a finding not previously documented).

My findings are limited in several respects. First, socio-behavioral ratings of parents and teachers completing these questionnaires might not relate closely to ratings provided to medical specialists for purposes of diagnosis. Teachers assigning these ratings might make comparative judgments because they believe it is likely to improve the quality of the survey, even though they would have a different motivation when completing a form provided by a medical specialist. Second, the size of the sample, the rarity of diagnosis, and the limitations of the questionnaires make it difficult to estimate the effects of all of the factors that contribute to diagnosis. Still, the findings are significant because they validate a performance-enhancement explanation for diagnosis in high SES schools that is driven by the existence of more stringent norms in high-SES schools.

Although I find little evidence that school and teacher attributes influence diagnosis, I find strong evidence that parents are drivers of diagnostic expansion through their interactions with teachers. Parents are working with teachers and schools to construct a category that privileges students in strong schools, with strong normative demands on attention, that are performing relatively worse than their peers and that have the resources to challenge interpretations of performance and behavior by teachers that are odds with parent interpretations. This is consistent with a version of medicalization – namely that parent activism became one of the key "engines of medicalization." But, as I argue in the next chapter, the neurobiological foundations of "attention" are contested, and educators have not conceded jurisdiction over learning and behavior problems that arise in schools. This means that medicalization is, at best, a partial story.

Chapter 4

Where Regimes Collide: ADHD as an Educational, Medical, and Legal Category

Two Anecdotes and a Disclaimer

Anecdote #1: The mother of a six-year-old boy described a situation at her son's school. His first-grade teacher suggests that the boy see a physician because he would not sit still in the classroom despite frequent reminders. Taking away privileges – including timeouts during recess and removal of privileges – does not seem to alter his behavior. The boy does well on spelling tests and is able to memorize math facts. He is not interested in reading but is able to keep up with his assigned reading group (one of the middle groups). At home, the boy can be unruly, but his mother attributed his behavior to normal development until the teacher began to express her concerns. The mother infers that the teacher is recommending stimulant medication but is concerned about medicating her son at such an early age. At the same time, she worries both that her son will fall behind in school and that his teacher will be less cooperative with her and her son if she does not take some action.

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Anecdote #2: A high-achieving student at an elite college preparatory school described a male classmate that she holds in particularly high regard. He is several years ahead of the other students in his math coursework (i.e., calculus in tenth grade), and he has an extremely devoted work ethic. Her classmate is an older student, having turned 16 during the summer before his 10th grade year. His age relative to classmates suggests that he either repeated a grade or was "redshirted," the latter being more likely. The student in question indicated that her classmate receives "extra time" on tests. She went on to explain that he has a "legitimate neurological deficit" and that many other students in her grade do as well. When asked about how many students received testing accommodations, she responded "at least 10% of my grade."

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Disclaimer: As a former practicing lawyer, I represented parents of children with disabilities in special education due process hearings and related federal court litigation. Later, I became the parent of a girl who has a genetic condition that is associated with attention *difficulties and visuospatial, mathematical, and memory deficits. My daughter receives special education services and takes stimulant drugs. Given my background – as a graduate student writing about ADHD, a parent of a child with a disability, and an attorney – I hear many stories from other parents and teachers about the problems they have faced with the special education process, the medical establishment, and home life. Although my background gives me a multifaceted perspective on the practical significance of the disorder in the modern education system, my stories are anecdotal and colored by context, necessitating this disclaimer.*

4.1 Introduction

This chapter examines the recognition of ADHD in the context of the legal system that provides for and requires "special" education programs and services for children with disabilities. Programs for "slow" learners extend back to the establishment of compulsory education by the States, but special education programs and services were not mandated by federal law until the 1970s, as part of a larger effort to equalize access to and improve the adequacy of public education across the United States. Federal involvement in education had a substantial impact on the creation of the category ADHD. To summarize the argument from Chapter 1, the pre-war problematization of the poor self-control of poor, minority, immigrant kids led into the grouping of a large range of symptoms under the minimal brain dysfunction label. That label became unworkable once a need arose for the development of alternative approaches to educating students with learning difficulties. The political advocates of a response to academic under-achievement had little interest in waiting for neurological evidence to document specific cognitive processing deficits, and educators were not interested in medical categories that contributed only indirectly to the remediation of classroom problems. So, the category learning disabilities was created, and educators used it to construct a jurisdictional space around high-incidence, low-severity learning and behavioral problems that surface in mainstream classrooms. Neurological advances since that time have enhanced the clinical validity of attention disorders, but, as I argue below, the neurobiological ontology of the disorder remains contested and educators have not responded by conceding jurisdiction over learning and behavior problems that arise in schools (with one important caveat that I discuss below).

My approach in this chapter is to examine the structure and content of the special education laws as they pertain to ADHD, with a particular emphasis on the resolution of individual legal disputes between school districts and parents or guardians regarding appropriate special education programs and services for children with ADHD. In those disputes, as in disputes about children with other disabilities, school districts defend the educational plans they devise to ensure that resources are allocated equitably, and staff present testimony as knowledgeable witnesses to children's abilities and behaviors. School district staff also serve as experts in pedagogy or assessment. Medical professionals offer expertise as to children's medical diagnoses and their significance for the issues in dispute. Parents offer their perspectives as to the unique needs of their children. The legal system, in turn, integrates the different perspectives in the form of a legal decision that resolves the dispute. Through this process, adjudicators filter competing claims through the lens of law, which contributes to a repackaging of the medical disorder into the disability classificatory schemes set forth in the Individuals with Disabilities in Education Act or the Rehabilitation Act. Studying legal decisions provides a rich understanding of the way that the legal system contributes to the reconfiguration of categories previously controlled by expert jurisdictions. This process addresses the needs of educators and the needs of parents and children through the joint maintenance of a medical and educational category.

To preview my findings, the disputes suggest that the diagnosis ADHD and the medication treatment often are successful in translating the interests and coordinating the actions of different parties. They do so because the parties do not need to agree on ontology most of the time. Medication and classroom accommodations can serve school, teacher, parent, and child needs in the ordinary case. In other words, medicine is able to translate everybody's interests, arriving at a provisional working arrangement. The hearings are useful because they document the times when the diagnosis is unable to perform this translation. When that happens, there are clashing ontologies or differing narratives of causation. To the extent that in those clashes one finds a medical ontology on one side, and a different ontology on the other side, it shows that "normally" the diagnosis works by papering over the ontological dispute and being able to be at one and the same time medical and pedagogic. As a result, the meaning of ADHD is shaped by the considerations of school districts such that ADHD is not purely a medical category but also a category of neurology, cognitive psychology, special education law, and special education and school district administration. In other words, schools, the legal system, medical professionals, and parents coordinate to achieve a "layering of institutional control" (Medina and McCranie, 2011, p. 139) over problems related to classroom performance.

As is often the case, medical knowledge is used in this context to individualize problems, both in defining them and in prescribing their treatment. Individualization removes responsibility from the problem child (and his or her parents) and, at the same time, places responsibility beyond the reach of schools – either the problem is placed under the care of experts, or it is subjected it to the realm of science and the technologies of science (Freidson, 1984, 2006; Parsons, 1951). As a result, the underlying diagnosis is used to represent an object that is more objective and stable than the categories maintained by educators. Furthermore, medicine is used to internalize the problem so that – although it can be influenced by the environment – cannot be caused by the environment. As a result, parents (particularly mothers) are not to blame for their childrens' problems, but they can work alongside experts in an attempt to dictate how the school environment should be adjusted in order to alleviate the student's internal symptoms. In this respect, the medical category is solicited not to secure medication and thus remove problems from the public realm (Conrad, 2005), but to provide a means through which parents can challenge and question the way their children are treated at school and within other institutional settings (Edwards et al., 2014).

Pursuant to this broader jurisdictional space that educators have retained, educators relegate the symptoms of hyperactivity and impulsivity to the realm of medicine, at least for treatment purposes. I show that educators have little need to contest the medical category if a drug treatment successfully regulates the more overt problems of classroom performance. Thus, in the ordinary course, educators work with experts and parents in the pursuit of a medical approach to treating behavioral issues in regular classrooms – sometimes forcefully. The prototypical case – a young boy that can't sit still in school – represented by the first anecdote above – hints at the way force can be applied. This mother asks herself: Is the school overreaching? Is the child developing naturally or is something "wrong" with him or her? Is the problem a "medical" one? Is the child likely to fall further behind if the parents are not proactive about seeking medical attention, particularly when academic demands increase? And, most importantly, will the school retaliate in some unknown way if the parent is not responsive to the school's concerns?

Medicalization is limited, however, by the ability of medicine to supply a solution to an underlying problem (Medina and McCranie, 2011). Thus, the collaboration around a medical solution breaks down when the drug treatment fails,[1] which can happen if the medications do not improve the symptoms or side effects (or personal preference) limit their use. Friction between parents and students, on the one hand, and teachers and schools, on the other hand,[2] occurs when parents remain dissatisfied with their child's academic performance or when teachers/schools believe that student behavior interferes with classroom management or the fulfillment of observable performance goals.

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[1] Medina and McCranie (2011, p. 150) show that the lack of a "silver bullet" treatment for the condition of psychopathy means that "medicine remains largely impotent with regard to containing the problem" although it is "ordered using medical language." As a result, psychopathy is an illness category that is controlled through criminal punishment.

[2] This is an oversimplification. Teachers do not always follow the direction of the school administrators, and parents and students are sometimes at odds with each other. Analysis of those issues does not materially advance my objective here.

Resource limitations contribute to much of the friction between parents and schools.[3] By training and professional identity, educators work to distribute limited resources in a way that is equitable and beneficial. That task has become increasingly complex in recent decades, with the increased state and federal roles in schools.[4] With larger infusions of aid, the federal government has overhauled the administrative aspects of its involvement in education and has imposed significant unfunded mandates, meaning that there are massive increases in costs at the state and local levels. Those mandates require school districts to demonstrate access and adequacy for all students, including students with disabilities and from disadvantaged backgrounds. They do this not only by evaluating performance on tests (the highly publicized accountability regimes), but federal and state governments also have begun to condition funds on satisfactory evidence of student safety and crime prevention in schools. The latter effort has led some scholars to claim that school discipline has been criminalized (Ramey, 2015), which has important ramifications for students with ADHD.[5]

With resources directed to satisfying these accountability and safety measures, one could argue that other aspects of school quality are neglected. Resource limitations at the

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[3] One study estimates that it costs schools $5007 more per student to educate a child with ADHD than it costs to educate a child without ADHD (Robb et al., 2011). This estimate is derived by calculating the costs associated with special education, grade retention, and disciplinary action. Whatever one thinks about the measurement strategy – or even the ability to quantify such factors – it is doubtless true that students with ADHD diagnoses impose additional costs on schools.

[4] School district funding and resource constraints have been highly politicized since the 1970s. Prior to the 1970s, the vast majority of school funding was raised at the local level (through local property taxes). This produced rampant inequality of resources, which ultimately led state supreme courts in many states to mandate centralized funding.

[5] The relationships among school discipline, accountability regimes, and the special education system create perverse incentives, as discussed in part in Chapter 2. It is well known that students with behavior problems score lower on standardized tests than students without behavior problems and that disruptive behavior has a negative impact on classmate's performance (Figlio, 2006; Ramey, 2015). But research also shows that schools respond to the accountability incentive by reshaping the testing pool through selective discipline (i.e., suspensions during standardized testing windows) (Figlio, 2006) and by systematically placing students from low socio-economic status backgrounds and historically low-performing students into special education categories that are exempt from the accountability system (Figlio and Getzler, 2006). Research also shows that schools and districts with relatively larger minority and poor populations are more likely to implement criminalized disciplinary policies, and less likely to medicalize students through behavioral plans put in place through Section 504 or IDEA (Ramey, 2015).

state, school district, and school levels directly affect the availability and qualifications of personnel — including teachers, psychologists, therapists (speech, occupational, physical, etc.), reading and other specialists, computer technicians, nurses, nutritionists, and aides and paraprofessionals. They also affect the physical learning environment, which supports the ability to engage in diverse pedagogies, use current technologies, facilitate social interaction as well as physical activity, and provide a safe, secure environment that is relatively free from distractions (Kuuskorpi and González, 2011). To be sure, educators face more pressure than ever to improve achievement levels, which should align parent and school incentives to an extent. However, the emphasis on average test scores does not necessarily benefit a particular student that would better respond to a more diverse set of instructional methods.

There are several narratives in the opinions that reveal the thinking about which students are "deserving" of school resources. The biggest unknown – and hence the biggest issue in many cases – relates to the student's potential, both in the sense of an academic trajectory and the ability to meaningfully participate in a school setting. Potential is a latent concept, which, by its very nature, cannot be observed, only assessed, either with standardized tests or by expert opinion. The second anecdote is a fairly extreme case (I think) that illustrates the dynamic between fundamental fairness (from the perspective of schools) and a child's potential (from the perspective of parents). What should be the realized potential of a student with ADHD – the top reading group, an honors class, or even high grades in an honors class or at an elite school? What if the medical evidence of ADHD is not definitive? Even if a child truly has a neurological impairment that impairs learning, should the child receive accommodations or programs designed to reach a potential that many, if not most, other students cannot reach, particularly if the same accommodations or programs would benefit the non-impaired students? The immediate question is framed in legal terms as whether the deficit "adversely affects a child's educational performance," but this requirement is juxtaposed against a competing emphasis on equality of access and outcomes.[6] By contrast, in medical terms (DSM-5), the framing is whether "the symptoms interfere with, or reduce the quality of ... academic functioning," and the broader context is the internal focus derived from medicine's approach to physical illness.

Another set of narratives involves causation. Did a neurological deficit cause a lack of motivation or is the supposed neurological deficit a post hoc justification for a lack of motivation that was the underlying cause? Did a neurological deficit cause impulsive behavior that led to disciplinary action or did the student's deliberate actions override the supposedly impulse-driven aspects of the student's behavior? Again, those are largely matters for expert opinion. Parents can bring medical experts to speak to these issues, but those experts face school experts – teachers, psychologists, and therapists – who see the student on a regular basis. Those issues become increasingly complex as the student progresses through school and causation begins to run both ways.

At bottom, I show that medical knowledge is contested not just when it individualizes student nonconformity (because educational categories do this too),[7] but when it confronts the jurisdiction of educators. From the perspective of educational advocates, the law juxtaposes learning issues — an educator's task — and behavioral issues — medicine's task. As a result, schools sometimes construct opposition between medicine and education: if an issue is behavioral and thus medical, then no school intervention is needed; if an issue relates to learning, then it is better evaluated under the learning disabilities framework. This dichotomous approach is demonstrated by the reluctance of educators to apply the OHI disability label, because it is identified with medicine. The strength of the ADHD category comes from the underlying duality of behavioral and cognitive symptoms, but

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[6] This is part of the definition for the Other Health Impaired (OHI) disability category. The DSM category is in even greater tension with the specific learning disabilities (SLD) category maintained by educators that directly embeds the concept of potential within it by using the discrepancy test.

[7] In the United States, disabilities are individualized (see Chapter 1), but this is not always the case elsewhere. Cooper and Ideus (1995), for example, describes the way that ADHD is altering views on emotional and behavioral difficulties in the United Kingdom, because of the focus on individual deficits as causes, and the associated danger that schools could become victims if ADHD is used to remove focus on the broader context – the curriculum, the school environment, and the relationships between teachers and students.

that duality is at odds with the dichotomous approach of educators. Nevertheless, I show that in the ordinary case ADHD serves as boundary object that facilities coordinated action without agreement as to ontology (Bowker and Star, 2000; Star and Griesemer, 1989).

4.2 Contestation at the Institutional Level

The school system has been described as a “mediating mechanism to diagnosis” (Singh, 2006, p. 445) and ADHD as a “disorder of educational performance” (Phillips, 2006, p. e182). The medicalization literature views teachers as “sickness brokers” (Phillips, 2006, p. e182), emphasizing the creation and expansion of ADHD as a medical category through the actions of teachers that work in concert with medical or other actors that advance a medical label. Some say that – even if they wished to do so – teachers lack the professional status to rival medicine in the management of disruptive pupils (Brancaccio, 2000; Rose, 1985, p. 102). Those accounts, however, pay little attention to local struggles between medical categories and other classification systems for children with learning and behavioral challenges. Ultimately, collaboration around a medical understanding, the broadening of which serves the interests of all parties, is presumed, not proven or explained.[8]

In *The System of Professions*, Andrew Abbott (1988) maintains that professionals make jurisdictional claims in three arenas: public opinion, the workplace, and the legal system. Although public controversy about the disorder has been in the forefront (see Chapter 1), the battles between educators and parents as to the significance of the diagnosis for educational purposes are an area of great interest that has received less attention in the literature. One notable exception is Claudia Malacrida (2004), who draws on data from interviews with Canadian and British mothers of children with ADHD to link the

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[8] Moreira’s (2006) study of sleep disorders shows that collaboration does not necessarily indicate a medicalization process. He argues that by relying on the framing of sleep problems as “medical,” medicalization ignores the way that researchers, clinicians, and patients interactively deploy the knowledge, techniques and technologies through which different sleep problems are understood and managed. He shows that the medical category is the outcome of collaborative links between sleep researchers, chest physicians, and the patients that opted to selectively use medical treatments.

more medicalized version of the disorder in Canada (compared to Britain) with the relative absence of alternative forms of discipline. In both countries, educators usually are the first to identify problem children; however, in Canada educators are likely to suggest the need for medical treatment, while in Britain, educators are ambivalent or even hostile to the medical label and instead are likely to suggest that families seek therapies to address the emotional, social, or behavioral needs of their children. Her analysis demonstrates that parents, teachers, and medical specialists must collaborate to maintain a successful diagnostic category; the absence of such collaboration in Britain presented a practical obstacle to its spread. Although Malacrida assumes that the country differences are explained by differences in the forms of discipline available to schools, I suspect the explanation is much broader.[9] The budgetary constraints on schools create a substantial incentive to control the translation of medical categories into disability categories. At the same time, the nearly complete integration of the symptoms within the school setting enhances the ability of educators to do so. The existing literature ignores the duality of behavioral and cognitive symptoms that form the disorder and the way that differences in the expression of those symptoms influence the relevance of medical expertise.

The following analysis therefore looks specifically at institutional contestation to map the influence of medical experts in these fora in addition to the influence of other forms of expertise. The analysis focuses on both the macro organizational level and the micro-level (the clashing of parent demands and teacher needs in very specific instances). To do this, I begin by providing a brief account of the special education laws as they pertain to ADHD.[10] I continue with a description of a dataset that I have compiled of legal decisions between parents and school districts related to programs, services, and accommodations for children with symptoms of ADHD. Then, I proceed with the main part of the analysis, which considers the relevance of medical approaches for legal disability in the contexts of

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[9] She couches this as an assumption that fits the data; this rationale does not surface in her interviews.

[10] In this Chapter, the term special education refers to the educational programs and services provided by school districts in accordance with federal law.

disputes about diagnosis, eligibility, provision of services, drug therapies, and student discipline. Contrary to the medicalization perspective, I show that educators are not "keepers" of the gate that leads to ADHD diagnosis and treatment. Rather, educators attempt to assert jurisdiction by treating the cognitive aspects of the disorder as a form of learning disability, because "learning" is their domain and because misbehavior is not seen as a symptom of a learning disability. Educators blame parents and children for behavioral problems (or they attribute them to a medically-recognized emotional disturbance); educators abjure the ramifications of any broader medical understanding of the behavioral symptoms. Finally, schools usually (but not always) prefer that students use drug treatments, and there are several ways in which they can exert pressure on families to pursue such treatments.

4.3 Background on Special Education Provisions Pertaining to ADHD

4.3.1 History of Federal Involvement in Special Education

Although special education programs date to the origins of compulsory education (Lazerson, 1983), it was not until the 1950s that the federal government began a coordinated response to the problem of educating children with handicaps. Federal funding initially targeted children who faced severe handicaps (many of whom would have been institutionalized in earlier years) (Lazerson, 1983). Early federal legislation (from 1958 to 1961) funded training for teachers of children with intellectual disabilities and children who were deaf (Public Laws 86-158, 85-926, and 87-276). Federal funding of in-school programs and services for children with economic disadvantages and disabilities began in the 1960s, when President Johnson's Administration set the aspirational goal of placing children on a level playing field for educational purposes without regard to economic disadvantage or disability (U.S. Department of Education, 2010; Martin et al., 1996). The first major piece of legislation that addressed economic inequality of students, the Elementary and Secondary Education Act of 1965 (ESEA) (Public Law 89-10), established a formula grant program that provided financial assistance to local education agencies on the basis of concentrations of children from low-income families in the areas to which they served. In the same year, Congress provided federal funds to support special educational services for institutionalized handicapped children through the State Schools Act of 1965 (Public Law 89-313). Then, Congress amended the ESEA in 1966 (Public Law 89-750) in two important respects. It established the Bureau of Education of the Handicapped to administer programs for the specific benefit of handicapped students, and it provided direct grant assistance to states for the benefit of institutions and schools that served students with disabilities (Kroll, 1983). The 1966 ESEA Amendment was the first piece of federal legislation to define categories of "handicapped" children: "handicap" was defined to include children who were "mentally retarded, hard of hearing, deaf, speech impaired, visually handicapped, seriously emotionally disturbed, crippled, or *other health impaired* children who by reason thereof require special education and related services" (emphasis added). Despite the far-reaching nature of the ESEA and amendments, those statutes simply provided partial funding to state and local governments and did not include a mandate that programs be made available for *all* children with disabilities (Martin et al., 1996).[11]

State legislatures were the first to pass laws *requiring* special education programs. Between the mid 1960s and early 1970s, most state legislatures passed legislation that mandated or provided funding for special education programs (Martin et al., 1996). Those programs were inadequately funded (even with federal assistance) and contained major ex-

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[11] In the late 1960s, Congress also enacted statutes targeted at early childhood education for children with disabilities, including the Handicapped Children's Early Education Assistance Act of 1968 (Public Law 90-538), which authorized experimental programs for handicapped children of pre-school age, and the Economic Opportunities Amendments of 1972 (Public Law 92-424), which authorized support for and increased Head Start enrollment for young children with disabilities (the Head Start program began in 1965).

ceptions, including the ability to exclude "uneducable" children. As of 1970, U.S. schools educated only one in five children with disabilities (U.S. Department of Education, 2010). Challenging the implementation of those laws, in the early 1970s, landmark federal court decisions interpreted the Fourteenth Amendment to bar schools from discriminating against students on the basis of disability; this, of course, was on the heels of the expansive interpretation of the Fourteenth Amendment in *Brown vs. Board of Education* (1954). The *Pennsylvania Association for Retarded Citizens v. Commonwealth* (1971) and *Mills v. Board of Education of the District of Columbia* (1972) decisions overturned state laws that allowed schools to deny services to disabled children either because of the severity of the disability or because of a lack of resources (Lazerson, 1983; Martin et al., 1996). Once state laws and federal court decisions made clear the states' responsibility for providing a free public education to all children, regardless of the severity of a disability, states joined advocates in seeking the passage of federal legislation that would subsidize the costs of special education (Martin et al., 1996).

In the 1970s, Congress enacted two major reforms that responded to this need: a nondiscrimination requirement (the Rehabilitation Act) and a more comprehensive educational grant program (through the Education for All Handicapped Children Act). The Rehabilitation Act of 1973 (Public Law 93–112) was part of a larger initiative to provide for vocational rehabilitation and removal of barriers that faced persons with disabilities. Part of the legislation – Section 504 – provided that any recipient of federal financial assistance (including state and local educational agencies that accepted federal funds) must end discrimination in the offering of its services to persons with disabilities. Section 504, however, included no funding for special education programs.[12] The Education for All Handicapped Children Act (the EAHCA or Public Law 94-142), enacted in 1975, expressly extended

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[12] As discussed below, the passage of the Americans with Disabilities Act in 1990 expanded the rights of people with disabilities to prohibit discrimination on the basis of disability in employment, public services, and accommodations. It has become a major avenue for litigation about disabilities in education. The Americans with Disabilities Amendments Act (2009) expanded those protections by clarifying that Congress had intended a broad interpretation of the term "disability."

the right to access a public education to all disabled children, guaranteeing each child a "free appropriate public education" in the "least restrictive environment." The EAHCA provided *partial* federal funding to states and local educational agencies to support special education programs.[13] States that accepted federal funding were required to provide equal access to education for children with physical and mental disabilities (ages 6-21).[14] The EAHCA required states to ensure that public schools identify and evaluate all handicapped children and create individualized educational programs with parental input that would emulate as closely as possible the educational experiences of non-handicapped students (89 Stat. 775, 781). The Act also required states to ensure that school districts provide an administrative process so that parents of disabled children could dispute decisions made about their children's education. A key assumption was that the provision of procedural due process would lead to systematic legal pressure on school systems, which would lead to uniformity of treatment (89 Stat. 781, 788). Although the Rehabilitation Act did not use a categorical approach to defining "handicapped individual," the EAHCA retained the categorical approach to defining "handicap" from the ESEA, and – due to the outpouring of political advocacy on behalf of those with learning disabilities – added the category SLD, which opened special education to children with mild, high-incidence disabilities (see Chapter 1).[15]

Congress reauthorized the EAHCA in 1990 (Public Law 101-476), at which time it was revised and renamed the Individuals with Disabilities Education Act (IDEA). Congress changed the terminology from "handicapped children" to "individuals with disabilities"

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[13] The fiscal year 2014 Department of Education Budget lists 15 percent as the federal contribution, with an estimated $1,767 cost per pupil for states (www2.ed.gov/about/overview/budget/budget14/index.html).

[14] Public Law 99-457, enacted in 1986, amended the EAHCA to require states to make available appropriate and free public education to children ages 3 through 5 who are disabled.

[15] The category actually was first used in the Elementary and Secondary Education Act Amendments of 1969 (Public Law 91-230), which extended the ESEA and consolidated existing legislation pertaining to children with disabilities. The category was added at the urging of the Bureau of Education for the Handicapped (BEH, the predecessor to OSEP). BEH rebutted claim that the OHI category would reach children with educational disabilities, on the grounds that the OHI category was too dependent on neurological evidence, which might not be definitive (United States House of Representatives, 1969, p. 9). So, even as of the late 1960s, OHI was seen as a medical disability.

(104 Stat. 1103). Despite the shift in emphasis from the handicap to the individual, the statute continued to define disability using a categorical approach. Intense lobbying led to the addition of two new categories – autism and traumatic brain injury – and the rejection of a new category for attention deficit disorders.[16] The reauthorization of IDEA in 2004 (Public Law 108-446) retained the major components of IDEA but changed some of the details and addressed new concerns that had arisen. Many of the changes brought IDEA in alignment with the No Child Left Behind Act (a reauthorization of the ESEA). For example, it required that all special education teachers be certified in special education (118 Stat. 2654). A new provision released schools from the SLD requirement to show a severe discrepancy between achievement and intellectual ability, allowing schools instead to use a research-based intervention as part of the evaluation process (118 Stat. 2706). And it imposed an obstacle to full-scale medicalization of the disorder by prohibiting State and local educational agency personnel from requiring a child to obtain a prescription for a substance covered by the Controlled Substances Act (21 U.S.C. 801 et seq.) as a condition of attending school, receiving an evaluation, or receiving services (118 Stat. 2691).

4.3.2 Federal Regulation of Special Education Programs, Services, and Accommodations for Students with ADHD

Despite federal and state backing, special education programs constitute a large share of local school district budgets (Parrish et al., 2003). The potential funneling of roughly 10 percent of the school-age population into special education programs is an impediment to viewing ADHD (and other high-incidence disabilities) as educational deficits. Schools therefore have an incentive to refer ADHD to the exclusive province of the medical pro-

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[16] Disability is defined by 20 U.S.C. 1401(3)(A) to include a child who by reason of one of the following conditions needs special education and related services: mental retardation, hearing impairments (including deafness), speech or language impairments, visual impairments (including blindness), serious emotional disturbance, orthopedic impairments, autism, traumatic brain injury, other health impairments, or specific learning disabilities. The Individuals with Disabilities Education Act Amendments of 1997 (PL 105-17) created a noncategorical classification, development delay, for children ages 3 through 9.

fessions – to act as if medication is a complete treatment for ADHD such that no special programs or accommodations are necessary in the classroom. At the same time, ADHD includes a heterogeneous set of symptoms that pose different problems for classroom management and achievement and that respond differently to medication.[17] Parents and advocates have worked to achieve recognition of ADHD as an educational category independent of the medication aspect of the medical domain (see Chapter 2). Subjected to greater levels of federal oversight designed to make schools "accountable" for educating all students, schools increasingly have incentives to strengthen the quality of education received by students with learning challenges (Harr-Robins et al., 2013, 2015).

Within the special education domain, ADHD has a growing presence, but it remains an amorphous category because – despite efforts by advocates seeking full incorporation into the law – ADHD was submerged in the regulatory law. ADHD (like autism) was not mentioned in the original text of the EAHCA but rather was covered, if at all, by implicit treatment in other categories. Although autism and traumatic brain injury gained explicit statutory recognition in 1990, the same legislation required the Office of Special Education Programs (OSEP), at the U.S. Department of Education, to collect public comments on the appropriate components of a definition of ADHD and to report the findings to Congress (104 Stat. 1105). The failure to recognize ADHD as a disability category resulted from contentious debates in which parent advocates argued that ADHD should be a qualifying disability, while educators contended that ADHD students should receive services only if they met the more stringent requirements for establishing an SLD (United States House of Representatives, 1990).

After receiving more than 2000 written comments, OSEP – in conjunction with the Office for Civil Rights – attempted to quell the parent advocacy effort by issuing a memorandum that restated the position that students with ADHD were eligible under existing

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[17] Although the research is not definitive, it appears that attentiveness is more closely linked to achievement and other social and behavioral skills are more closely linked to classroom functioning; of course, those skills are likely to be interdependent (Duncan et al., 2007).

IDEA categories including SLD, serious emotional disturbance (ED), and OHI.[18] Establishing eligibility as a child with an ED was not seen as a useful path for parents, because of the connotation of serious emotional and behavioral challenges and the concomitant likelihood of a placement in a specialized school. Parent advocacy groups therefore pursued a dual-prong approach of pushing the application of the SLD and OHI categories; the goal was to convince the Department of Education to recognize ADHD as a subcategory of either of those general statutory categories, so that a medical diagnosis of ADHD would be conclusive (or nearly so) of special education eligibility (Joint Policy Memorandum).

The problem with the SLD category was that educators had distanced themselves from neurological evidence by insisting that there be a demonstrable effect on learning, i.e., a severe discrepancy between actual and potential achievement. Because SLD was defined as "a disorder in one or more of the basic psychological processes ... [including] such conditions as perceptual disabilities, brain injury, *minimal brain dysfunction*, dyslexia, and developmental aphasia," the National Center for Law and Learning Disabilities asked the Department to clarify that ADHD is expressly covered by IDEA as a form of SLD because "minimal brain dysfunction" is the predecessor term for ADHD.[19] This approach was rejected on the grounds that a medical condition, such as minimal brain dysfunction, would not qualify a student as SLD, in the absence of a severe discrepancy between ability and achievement. In any event, the Department was firm that ADHD alone would be insufficient to establish eligibility (Letter to Latham 1994). Parent advocates walked a very fine line: on the one hand, they did not want the disorder to be defined by the behavioral/emotional characteristic of impulsiveness; at the same time, they wanted to avoid the stringent test to qualify as SLD. Attention is the linchpin of the category because it is polysemic and can capture the hybrid nature of the disorder.

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[18] Joint Policy Memorandum, Office of Special Education and Rehabilitative Services ("Joint Policy Memorandum"), 18 IDELR 116 (Dept. of Education 1991).

[19] Letter to Latham, Office of Special Education Programs (1994), 21 IDELR 1179; see also Letter to Bentsen, Office of Special Education and Rehabilitative Services (1990), 16 IDELR 961; In the Matter of a Child with Disabilities, Michigan State Agency (1989), 16 IDELR 574.

OHI therefore emerged as the parents' preferred category, but a controversy also arose over the application of the definition of OHI to students with ADHD. The initial regulation defined OHI as "limited strength, vitality, or alertness" due to certain health problems including lead poisoning, epilepsy, and others. Educators and parents disagreed over whether this language covered the distractibility associated with ADHD. This ultimately forced the Department to issue another memorandum – hoping to alleviate parent complaints – that stated that a student with ADHD may have a limited ability to attend to academic tasks if the disorder causes the student to be overly alert to the general environment.[20] Eventually, as the number of students taking advantage of that informal advice rose, the regulation was amended to include ADHD specifically within the OHI category. The regulatory definition for OHI now states:

> Other health impairment means having limited strength, vitality, or alertness, including a heightened alertness to environmental stimuli, that results in limited alertness with respect to the educational environment, that –
>
> (i) Is due to chronic or acute health problems such as asthma, attention deficit disorder or attention deficit hyperactivity disorder, diabetes, epilepsy, a heart condition, hemophilia, lead poisoning, leukemia, nephritis, rheumatic fever, sickle cell anemia, and Tourette syndrome; and
>
> (ii) Adversely affects a child's educational performance.[21]

The Department issued additional "guidance" to clarify that a medical diagnosis of ADHD is not sufficient to justify services.[22] Rather, parents must establish that the disorder adversely affects the child's educational performance. It is common for IDEA coverage to be refused despite a medical diagnosis. This concern first came out in testimony before the congressional subcommittee considering bills that would add ADD to the list of officially recognized disabilities (United States House of Representatives, 1990) when Judy Schrag, the Director of OSEP, explained that "physicians use a medical model, ..., [that] does not

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[20] Letter to Cohen, Office of Special Education Programs (1993), 20 IDELR 73.

[21] 34 Code of Federal Regulations sec. 300.8(c)(9).

[22] See Letter to Gallagher, Office of Special Education Programs (1996), 24 IDELR 177.

have an education threshold." However, because DSM-5 requires that a diagnosis be based on "clear evidence" of reduction in the quality of academic functioning, the educational qualifier is substantively superfluous. Placing the determination in the hands of educators (and the legal system) is what is consequential. And despite the amendment to the regulation and the advice of the Department of Education, I show below that educators still prefer to place students with ADHD in the SLD and ED categories.

4.4 Data

The data come from legal opinions in cases across the United States that were decided during the period between 1990 and 2010 and that refer to the strings attention*, ADD, ADHD, Ritalin, Adderall, hyperactivity, and stimulant*. The IDEA includes rules for resolving disputes between parents and schools; the rules allow for mediation, due process hearings, and appeals to state or federal court. A large share of the disputes are resolved through mediation. But when a dispute is resolved through due process hearing, it is usually an adversarial trial, including battles of expert witnesses. These decisions then can be appealed in federal court. There also is a complaint resolution process in the Office for Civil Rights, which has jursidiction over complaints for discrimination, harassment, or retaliation on the basis of disability. Finally, in limited circumstances, original actions can be filed in federal or state court that involve disputes between parents/children and schools. I collected hearing decisions from individual state websites and agencies, and I supplemented the sample with decisions from a legal reporter, the *Individuals with Disabilities in Education Act Report* (IDELR), which publishes selected decisions of interest. This was necessary because the legal reporter has earlier coverage than is available through some state agencies. I also included complaint resolutions of the Office for Civil Rights, as well as state and federal court decisions that relate to ADHD in schools. Despite some gaps, this is the most comprehensive compilation of cases involving students with ADHD

Table 4.1: Distribution of Decisions by Jurisdiction

	Number of Decisions
Office for Civil Rights	520
State Courts	55
Federal Courts	680
State Education Agencies	1200

of which I am aware. For each decision, I collected a copy of the opinion, along with a case identifier, the date of decision, the legal jurisdiction that issued the decision, the basis of the hearing request (e.g., placement, eligibility, discipline, assessments), the outcome of the hearing, and a brief summary of the ruling. The resulting dataset contains approximately 2500 cases, which can be broken down by jurisdiction as shown in Table 4.1. The decisions of State Education Agencies come from 44 states (including the District of Columbia) (see Table A.2) and involve issues concerning eligibility, discipline, and placement (see Table A.3). Of those, only about half contain more than a passing reference to the disorder or to attention issues. Within that more limited sample, I read the cases carefully with a view to identifying recurrent themes, using an iterative process of categorizing and reanalyzing the data. Using keywords related to the categories that emerged from the data, I used the lexical search feature in MaxQDA to categorize and label cases along certain dimensions of interest. I found all cases involving diagnostic issues under the Diagnostic and Statistical Manual (DSM) or diagnostic tools including the prominent behavioral scales, medication issues (with discussions of Ritalin, Adderall, or stimulants), behaviors such as lack of motivation or lack of interest, manifestations of disability, experts including psychiatrists, psychologists, pediatricians, or physicians, eligibility or eligibility category issues, and issues pertaining to academic progress.

With this research design, I was not able to address some aspects of the tension between medical and educational approaches. Due process hearings are a strategic site chosen because resistance to medical approaches exists – almost by definition. An examination of disputes would be misleading if there are a substantial group of children that are treated within the medical regime without any school involvement. On this topic, first recall that not all diagnosed students receive accommodations or special education services; state-level estimates suggest that 30 to 70 percent of those diagnosed with ADHD receive special education services (see Chapter 2, Figure 2.6.1).[23] This means that medical treatments are an adequate solution for some students with an ADHD diagnosis, and some students are able to procure effective classroom interventions outside the special education system. On the other hand, this concern is undercut by the DSM requirement that diagnosticians solicit and score teacher ratings, making teacher input a necessary but insufficient step towards receiving a diagnosis. Still, it is likely that schools remain unaware of the diagnoses of some children and that in some cases they act as gatekeepers for medical professionals. Accordingly, I cannot use the existence of disputes to quantify the amount of disagreement or to demonstrate how children with ADHD are managed in the classroom in the absence of a dispute.

At the same time, the proportion of IEPs that result in disputes and the proportion of disputes that are resolved by hearings are both quite low.[24] This suggests that an examination of reported legal decisions obscures a substantial amount of disagreement that occurs during IEP meetings and pre-hearing stages. Moreover, although certain populations may be more or less likely to experience deprivations of educational rights, to interpret them as violations, and to seek due process, it remains unclear where such bias might lie. Are more educated individuals likely to file given their greater access to resources? Or, are lower status individuals more likely to file given that they attend schools where violations are more prevalent? There are no studies that resolve these questions. Such bias

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[23] I am not aware of any national data regarding the proportion of students (either overall or with ADHD) who receive accommodations in schools.

[24] In 2009, approximately 6.5 million students, aged 3-21, were served under IDEA in the 50 states and the District of Columbia (representing about 8 percent of the resident population aged 3-21). About 18,000 due process complaints were received during 2009 through the dispute resolution process for students ages 3-21 served under IDEA, and about 69 percent of the complaints were resolved without a hearing. (U.S. Department of Education, Office of Special Education and Rehabilitative Services, 2014). About 27 percent of students served under IDEA are reported to have ADHD (Schnoes et al., 2006; Office of Special Education and Rehabilitative Services, 2003).

should not be problematic for the analytical aims of this chapter, however, because the intent is not to predict overall levels of legal violation. Rather, the principal aim is to clarify how the medical category functions in school contexts and the various ways in which it is reconfigured.

Another challenge is that legal decisions give only one side of the story. The opinions are narratives that omit discussion of many of the arguments and much of the evidence presented by the parties. Although the data indicate that school districts win roughly 55 percent of these cases outright (defining a "win" as a case where the parents prevailed on few if any issues), I cannot actually quantify the level of success that parents or schools have in these proceedings because hearing officers and judges have a great deal of latitude in deciding how to frame the issues decided.

At bottom, my strategy is to use the disputes to assess the nature of contestation between the interested parties and the species of arguments that are raised when disputes emerge between parents and educators (Boltanski and Thevenot, 2006). The relatively small number of disputes given the huge numbers of diagnoses might be interpreted in different ways. It might suggest that school districts defer to the medical category in the vast majority of cases. Or, it might reflect a normal state of affairs in which the category is regulated by educators to avoid medicalization and to protect jurisdiction. I focus specifically on the capacity of the medical model to extend into other contexts, as medicalization theory would predict, and the specific nature of the friction that emerges. If the diagnostic category is recognized fully oustide of medical institutions, it might open the door for treatment, reimbursement, and public insurance, which it assuredly does, as well as disability status and special education, where its significance is less clear. My overall objective is to use this narrow slice of disputes to shed light on how medical expertise is reconfigured in the schools and in the legal system.

4.5 The Insufficiency of Medical Approaches for Educational and Legal Understandings of Disability

Looking ahead, the main points of the analysis are as follows. Legal disputes about ADHD arise out of attempts by schools to calibrate interests in maintaining classroom order and meeting performance goals while facing resource constraints. Medical approaches can be an impediment to the ability of schools to achieve those goals. Educators prefer a classification of SLD or ED – with medication, so that they can implement disciplinary measures and allocate resources in an equitable way. Medical approaches also interfere with the the equitable enforcement of the special education laws. Expansive enforcement of special education laws has become particularly controversial as applied to high-incidence disabilities such as learning disabilities and ADHD, with some scholars going so far as to refer to the entire framework as affirmative action for elites (Kelman and Lester, 1998; Lerner, 2004). Those public concerns are sometimes reflected in the explicit resolution of disputes. The following analysis works through these points in a rough chronological fashion – moving from diagnosis, to eligibility, to placement, and concluding with some of the ramifications of treating behaviors as symptomatic of the disorder. I start with a brief look at drug therapies and schools.

4.5.1 Drug Therapies

Pharmaceutical companies are said to be an "engine" driving the expansion of the medical category (Conrad, 2005). Through aggressive marketing, pharmaceutical companies appeal to parents to seek drug solutions; they also have campaigns designed to reach educators (Phillips, 2006). The 2004 IDEA amendments prohibit schools from requiring a child to use stimulant drugs as a condition of attending school, receiving an evaluation, or receiving services.[25] That legislation provides indirect evidence that overuse is a social problem and that schools have been complicit in promoting drug use. However, it is unlikely that the law alone altered school practices completely. The duty to provide appropriate programs and services to children with a disability means that schools remain actively involved in questions about the usage and effectiveness of medications, and the anecdote that began this chapter suggests that coercion falling short of (or amounting to) conduct that would violate the law might occur.

Questions about the use of medications to treat ADHD symptoms have led to disputes between parents and schools regarding the proper role of schools with respect to the use of medications. But the disputes cut different ways; there is no singular perspective on the appropriate use of drugs to treat ADHD symptoms in schools. One area of dispute relates to whether a school is "on notice" of a potential disability when it learns that a child is using medications for ADHD. In one case that illustrates this point, the grandparent of a student with ADHD filed a complaint with the Office for Civil Rights (OCR) alleging that the school district suspended the student twice for behavior that was related to his disability.[26] According to the complaint, the student had been temporarily taken off his medication, and this resulted in his misbehavior. OCR concluded the district failed to promptly hold a Section 504 meeting to address the student's behavior. Once the district was aware of the change in the student's medication and the change in his behavior, it was required to develop an individual behavior management plan for the student. In other words, the district could not simply ignore the child's use (or discontinuation of use) of medication. Medication is not a private matter; schools are involved in its administration (see examples

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[25] Federal court decisions and state legislation addressed forced medication well before Congress enacted the IDEA amendment (Berntsen, 2005). *Valerie J. v. Derry Cooperative School District*, 771 F. Supp. 483, 490 (D.N.H. 1991), for example, was a widely-publicized case that held that a student's "right to a free appropriate public education could not be premised on the condition that he be medicated without his parents' consent." Thus, explicit coercion was probably relatively rare throughout the period covered by this dataset.

[26] Westside Union Sch. Dist., Office for Civil Rights, Western Division, San Francisco (California), Case No. 09-95-1129-I, November 22, 1995, 24 Individuals with Disabilities Education Law Report 182.

below), and schools cannot treat ADHD as a fully medicalized condition by ignoring the consequences of medication secession.

Not only are schools involved in the distribution of medication,[27] but they can be responsible for failing to administer a midday dosage of medication correctly. Consistent with ethnographic work that suggests a strong professional identity attached to concerns about the potential for harm to children from overmedication (Rafalovich, 2007), disputes arise out of challenges from parents claiming that schools failed to administer medication to their children consistently. In one case, OCR found that a school district's failure to ensure that a student consistently took her prescription medication violated the student's right to an appropriate education.[28] In another case, when parents of a student with ADHD complained that the student did not receive his dosage of Ritalin at school,[29] the school took the position that the student "forgot" to come to the principal's office to have the medication administered to him. Finding that the administration of medication is a related service under the Rehabilitation Act if the medication is necessary to assist a child in benefiting from his educational program, the hearing officer found that the school violated the Act by failing to ensure that the student received his Ritalin on a number of instances.

Resistance also took the form of a school nurse's refusal to administer the dosage prescribed by a student's physician. An elementary school student from Missouri with an ADHD diagnosis had been given his prescription medication by the school nurse for approximately two years.[30] The nurse then determined that the student's dosage was in ex-

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[27] According to follow-up studies of the subjects in the MTA Study when they were in high school, school staff reported that medication was administered for 15.6 percent of the students (Murray et al., 2014).

[28] San Juan Unified Sch. Dist., Office for Civil Rights, Western Division, San Francisco (California), Case No. 09-93-1090, July 6, 1993, 20 Individuals with Disabilities Education Law Report 549.

[29] San Ramon Valley Unified Sch. Dist., Office for Civil Rights, Western Division, San Francisco (California), Case No. 09-91-1198, October 3, 1991, 18 Individuals with Disabilities Education Law Report 465.

[30] Davis v. Francis Howell School District, 104 F.3d 204, U.S. Court of Appeals, Eighth Circuit, January 9, 1997.

cess of the dosage recommended in the Physician's Desk Reference. She asked the parents to get a second doctor's opinion concerning the safety of the dose. Even though the second opinion confirmed the dosage, the nurse refused to continue administering the student's medication. The school district backed the nurse's decision, but allowed the parents to come to the student's school and administer his medication. The parents filed suit in federal district court, alleging the district's refusal to give the student his medication violated federal law. On appeal of a decision in favor of the school district, the circuit court concluded that the refusal to administer the student's medication was not a violation of law. According to the court, the district based its refusal on a policy prohibiting the administration of medication in excess of the recommended dosage, which was justified by liability concerns and health reasons.

Those cases suggest school resistance to involvement with medication, but they do not suggest that schools implicitly require use of medication. But other cases do display compulsion on the part of schools. For example, in response to serious behavior problems of a high school student with severe ADHD, a school district placed him at an adolescent day treatment center.[31] At the center, the student performed well academically and improved his behavior, but his behavior problems at home did not subside. As a result, his parents unilaterally placed him in an out-of-state residential care facility and sought reimbursement for that placement at a due process hearing.[32] The evidence indicated a factual dispute over the question of whether the student had been allowed to attend the day treatment center during periods he was unmedicated. The student's mother testified that school officials would not allow her son to attend without his medication, so she removed the child from the center when she felt that he had reached the point where the medica-

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[31] Oregon City School District, #62, Oregon State Educational Agency, Case No. 95-126, January 5, 1996, 23 Individuals with Disabilities Education Law Report 688.

[32] This fact pattern actually is not uncommon. When students are removed from mainstream environments, it is easier for schools to accommodate them and to conclude that the medication is working. At the same time, the parents might feel that the student is not learning enough or that his/her behavior at home has deteriorated (due to low self esteem or for other reasons).

tion was no longer working. The school district denied that it conditioned enrollment on continued use of medication, saying it was only a recommendation. Influenced by that denial and the fact that plans were in place for the residential center before the medication dispute arose, the hearing officer ruled in favor of the school district. Regardless of the specific facts of this case, the case highlights the fact that the pressure to use medication can come from schools and not only from doctors.[33]

The legal and moral responsibility of parents for their children's behavior also can be a form of coercion. One notable case that reached a state supreme court involved a fourth-grade student who took a stimulant drug for a short period.[34] After his parents decided to stop administering that drug to him without informing the school, the student became unruly and his special education teacher was called to a regular classroom to control him (his placement was split between regular and special education). The student pulled the teacher's hair and she fell to the floor, injuring her neck. The teacher sued the parents' insurance company for damages, and a state trial court entered a jury verdict in favor of the teacher. On a second appeal, the state supreme court held that the student's parents had a duty to take reasonable steps to control the student's behavior. Although the court agreed with the insurance company that the parents' decision to take their son off of the medication in and of itself did not constitute negligence, it found that jury reasonably found that the parents were negligent when they failed to inform the school district about the discontinued drug use. According to the court, had the district known about the parents' actions, it could have responded by developing a plan to manage the student's behavior. Holding parents responsible for the consequences of discontinued drug use is another way in which the pressure to use medication comes from schools.

Another set of issues relates to the significance of a schools' express adoption of a med-

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[33] Even though this case was decided before the 2004 amendment, many states and local school districts had laws and policies that precluded mandatory medication before that statute was implemented. I use the case as an example of types of coercion that might occur without a direct ultimatum.

[34] Nieuwendorp v. American Family Ins. Co., 510 N.W.2d 779, Wisconsin Court of Appeals, December 21, 1993. Reversed by Wisconsin Supreme Court, 529 N.W.2d 594, April 5, 1995.

icalized perspective – that medication (if taken) would treat the symptoms so that no accommodations and or special education programs are needed. This itself can be a form of implicit coercion. One common fact pattern occurs when schools attribute student underperformance to the failure to use drug treatments. Congress amended the ADA in 2009 to make clear that the "ameliorative" effects of "mitigating" measures, such as medication, should not be considered in a disability determination under the Rehabilitation Act.[35] The OCR has interpreted this statutory amendment to mean that, in making disability determinations, a school district must consider a student's symptoms without the ameliorating effects of his stimulant medication.[36] Before that amendment, schools did take account of the potentially ameliorative effects of medication in making disability determinations. For example, a discrimination case from 1992 involving a student from Michigan with ADHD, involved the requirement imposed by a school district that one of the student's parents accompany him on a field trip due to his poor behavior.[37] Because neither of the parents could take off from work, the student consequently was not allowed to participate in field trips. The parents claimed discrimination on the basis of disability, and OCR found that the district's awareness of the student's academic and behavioral problems associated with his ADHD prior to the field trip, and its failure to conduct an evaluation, constituted a violation of Section 504. While in second grade, the student was diagnosed, and since that time, the student had been taking Cylert, prescribed by a doctor, to control symptoms associated with his ADHD. The school administered prescribed medication to the student throughout the school year to control symptoms related to ADHD. The staff did not refer the student for an evaluation because they believed the student was intelligent and could control his behavior when he chose to do so, and they believed the student did not have

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[35] It is important to note, however, that this statutory requirement does not directly apply to the IDEA determination of eligibility.

[36] Virginia Beach City Public Schools, Office for Civil Rights, Southern Division, D.C. (Virginia), Case No. 11-09-1158, October 22, 2009, 54 Individuals with Disabilities Education Law Report 202.

[37] Decatur Pub. Sch., Office for Civil Rights, Midwestern Division, Cleveland (Michigan), Case No. 15-92-1207, November 19, 1992, 19 Individuals with Disabilities Education Law Report 592.

problems as long as he took medication prescribed for his ADHD and received extra help in the classroom.

In sum, teachers and schools embrace medication as a way to treat symptoms. Educators work with medical diagnosticians and parents in the pursuit of a medical approach to treating problems in regular classrooms. They do this by being the first to identify relative deficiencies in students and by completing rating scales to assist parents and medical specialists who are seeking a diagnosis. Sometimes schools embrace medical approaches forcefully, and I show above a few different ways that implicit coercion might occur. However, there is also evidence that schools prefer to avoid direct involvement in medicating children in schools, perhaps because of concerns about medicating children or perhaps because handling medication is administratively burdensome and risky.

4.5.2 Diagnostic Credibility

Although teachers often are the first to recognize symptoms (see Anecdote #1, Mayes et al. 2008; Sax and Kautz 2003), there are few disputes involving school efforts to persuade parents to seek medical diagnoses on the basis of ADHD-type symptoms. This might seem surprising given the evidence that disadvantaged children are more likely to be funneled into special education placements, suggesting a type of social control that might seem objectionable to parents (see Chapter 2). The parents of disadvantaged children, however, are less likely to think that a medical diagnosis is useful in securing an appropriate eligibility classification or placement and probably are unable or unlikely to challenge school efforts to move them into such placements.

Legal disputes start to surface when parents seek medical help for their children from professionals who apply medical diagnostic criteria to explain "symptoms." Medicalization theory assumes that medical diagnostic tools have wide-ranging application in institutions such as schools. If so, educational and medical diagnostic tools would overlap to a considerable extent, and medical diagnostic categories would circulate fluidly within educational institutions. Although schools might apply higher thresholds to determine special education eligibility, they would embrace or at least acknowledge medical categories without questioning the reliability of medical professionals, tests, or classifications. The data, however, suggest that something quite different occurs with regularity. In my examination of disputes, I found that medical diagnoses do not always circulate fluidly through the special education administrative process. Although a medical diagnosis can trigger a district's obligation to identify a student with suspected disabilities, the credibility of medical diagnoses often is disputed. School districts have questioned the qualifications of medical specialists to diagnose the disorder as well as the procedures used to make diagnoses. As a result, the disputes reveal a tension regarding the relevance of medical expertise for educational and legal understandings of disability, wholly apart from a desire to minimize the obligation to provide costly services.

Concerns about the credibility of medical diagnoses expressed in special education disputes reflect sentiments similar to those seen in the press and public opinion. Specifically, schools argue that the diagnostic process is too cursory, that it is performed by unqualified specialists, that it merely substitutes a medical label for what educators understand to be a lack of motivation, bad parenting, or immaturity, and that proof of biological etiology is lacking (see generally Reid and Maag, 1993). For example, in a case from Illinois, decided in 2010, a school district challenged both the qualifications of a medical specialist that diagnosed a student with ADHD and the process through which the diagnosis was made.[38] The student's mother filed a discrimination claim under the Rehabilitation Act after her son was ruled ineligible to participate in high-school athletics. She claimed that her son was unable to meet his academic requirements without appropriate treatment or accommodations for his disability. A "licensed clinical professional counselor" had diagnosed the student with ADHD, and a family physician prescribed stimulant medication following a

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[38] *Rademaker v. Midwest Central High School*, Case No. 10-3332, U.S. Dist. Ct. C.D. Ill., December 22, 2010.

telephone call with the counselor who told the physician that the student was "positive on the ADHD scale." Rather than accepting the diagnosis at face value, the school district argued that the counselor was not competent to diagnose the disorder (as a matter of professional credentials) and that the physician's implicit acceptance of the diagnosis was insufficient to establish the existence of the disorder without an independent examination of the student. The court agreed and held that, without a valid diagnosis, there was no basis for a claim of discrimination.

Because only licensed physicians can prescribe medication, it is common to see referrals for medication purposes only, as in the Illinois case. The DSM itself is agnostic as to which types of medical specialists can diagnose patients; mental health and other health professionals, including psychiatrists and other physicians, social workers, nurses, occupational and rehabilitation therapists, and counselors all can apply the criteria.[39] Individual healthcare professionals are regulated through state licensing laws, but there is no indication that the cases to which I refer involved unlicensed activity. If a counselor is a licensed professional with authority to make a diagnosis (one that is respected by a licensed physician), why should a school question that medical determination? The Illinois decision directly confronts the ability of the medical profession to self regulate (through the apparatus of state law). And the ruling was not an isolated occurrence. Nor does it apply only to "counselors." It was not uncommon for school districts to challenge the diagnoses of clinical psychologists as being insufficient to establish that students had the disorder, and school districts often challenged physician diagnoses for the purposes of prescribing medication as insufficient because they were not based on independent examinations of the students. The legal decisions are not always decided in favor of school districts, but the reasoning often indicates distrust of the medical profession's ability to determine who can apply the diagnostic criteria.

The DSM criteria systematize diagnosis by clinicians of different theoretical orienta-

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[39] According to the website, http://www.dsm5.org/about/.

tions who seldom, if ever, directly observe typical behaviors in the classroom setting. Yet the criteria depend on subjective assessments of behavior. Recommendations for ADHD diagnosis vary by specialty, but all include a clinical history and ADHD-focused rating scales (Gualtieri and Johnson, 2005). Depending on the medical specialty, a diagnostic process also might include a vision and hearing screening, mental status examination, developmental testing, school reports, and computerized tests of attention or other cognitive testing (Brock et al., 2009; Gualtieri and Johnson, 2005). Obviously, a pediatrician is more likely to conduct a vision and hearing screening, while a psychologist is more likely to use cognitive or developmental tests. Some states and school districts allow school psychologists to make ADHD diagnoses, but others do not (Brock et al., 2009). Nevertheless, schools are required to screen students for ADHD and to make referrals if school professionals identify warning signs of ADHD. In either case, schools rely heavily on personal observation, narrow- and broad-band rating scales (testing for ADHD alone or a broader set of behavioral, emotional, and learning issues), and psychological testing to assess for learning and behavioral problems. The lack of personal involvement with the child underlies much of the skepticism that educators express with regards to the medical diagnostic process.[40]

School districts also have challenged the application of medical diagnostic criteria to students. A 1997 case from Texas is illustrative.[41] In that case, a school district challenged a diagnosis in the context of a claim for reimbursement of the costs of private school after a student's public school refused to place the student in a special education program. The student had minor "issues" in elementary school, but during the transition to middle school the student began to have serious behavioral and academic problems. In seventh grade,

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[40] Educators draw a contrast to the diagnostic practices of medicine by pointing to their parallel process that necessarily involves personal attention – including personal evaluation of learning differences. This is, in part, a boundary-drawing exercise that allows educators to maintain control over their realm of expertise, which is learning (Gieryn, 1983)

[41] Humble Independent School District, Texas State Educational Agency, Case No. 040-SE-996, May 20, 1997, 26 Individuals with Disabilities Education Law Report 204.

he was diagnosed with ADHD – based in part on a teacher rating scale – and he began to take Ritalin. Although he responded well to Ritalin, the student did not take the drug consistently. Following an incident during ninth grade that was not described, the principal recommended expulsion, at which time the student's mother finally asked the school district to complete an assessment of her son for purposes of determining his eligibility for special education. The school district completed the assessment and determined that the student was ineligible, ruling out an ADHD diagnosis. The district's psychologist determined that a "neurological" impairment would not occur "suddenly" in middle school. He also found that the student's behavior was "too variable" to be consistent with ADHD. At a due process hearing, several experts for the school district testified that the student did not have ADHD and that his problems in school were attributable to typical misbehavior and lack of motivation (the causation narrative described above). The parents' experts testified that the student's trajectory was consistent with ADHD and that the variability of symptoms was a "telltale sign" of the disorder. The hearing officer ruled for the school district. Because the student had received "mostly passing grades" and had only "minor behavioral problems" during his elementary school years, the hearing officer found that there was no evidence of onset of symptoms by the age of 7 (one of the key elements of the diagnostic criteria at the time, see the Appendix). Without commenting on the testimony of the student's expert, the hearing officer accepted the school district expert's testimony about the variability of symptoms and its inconsistency with ADHD. The hearing officer did not acknowledge the possibility that the inconsistent use of Ritalin would lead to symptom variability. In this case, it appears that the evidence required to shift the narrative from medical to undermotivation/misbehavior was the personal connection between the school district's psychologist and the child; the school district's narrative regarding the child was consistent with a typical adjustment process that occurs during the transition to middle school (a topic well within the school psychologist's expertise).

A consequence of the lack of direct, in-school observation as a part of the medical diagnostic process is that a medical professional cannot easily rebut a school district's case when the student's teachers do not see evidence of ADHD in school. At least within the domain of special education, teachers are regarded highly as experts in all matters involving learning; this can present a problem for children diagnosed with the predominantly inattentive dimension. An illustrative case from 2010 involved an Illinois elementary school student with inattention symptoms.[42] The student's mother testified that she had concerns about the student's education as early as preschool. When the student's second grade teacher became concerned about her "inattention," the student's mother took the student to a physician for an evaluation. The student's primary care physician found possible ADD; he recommended an ear-nose-throat evaluation to rule out other problems, followed by a trial of medication if the ear-nose-throat evaluation did not reveal any treatable problems. The student's parents requested a formal evaluation from the school, but this was not undertaken until fourth grade (apparently because the school was pursuing various response-to-intervention strategies and waiting for the results of hearing and speech tests). The school district's psychoeducational assessment did not reveal a severe discrepancy between achievement and ability (the test for SLD), and behavior ratings were "inconclusive" for hyperactivity and impulsivity. The school ultimately found that the student was not eligible, at which time the parents obtained an independent evaluation by a licensed psychologist. The psychologist conducted a test battery of 33 assessments (some of which involved rating scales completed by the teacher) and an interview before diagnosing the student with combined type ADHD. The opinion does not identify the 33 assessments, but it was likely to have been a full neuropsychological evaluation, designed both to test for ADHD and to exclude other causes. Two of those assessments revealed clinically significant symptoms; however, the psychologist testified that those two assessments

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[42] Meridian School District 223, Illinois State Educational Agency, Case No. 2010-0234, September 9, 2010, 56 Individuals with Disabilities Education Law Report 30. A similar case where school witnesses saw no evidence of inattention is Newport-Mesa Unified School District, California State Educational Agency, Case No. SN02-01489, May 11, 2004.

– the Conners' Continuous Performance Test-II and the Integrated Visual and Auditory Continuous Performance Test – were considered the "gold standard" for assessing ADHD (but see Brock et al., 2009; Gualtieri and Johnson, 2005, who say there is no gold standard test).[43] The hearing officer found the data "inconclusive, at least as it applies to the school setting," because the student's current teacher testified that she does not see evidence of ADHD at school" and the "behavior scales [the teacher] completed as part of the independent evaluation showed scores within normal limits." Unlike the previous cases, this case involved what was apparently a very thorough evaluation by an independent psychologist (which was consistent with a previous teacher's concerns), but the current teacher's observations took precedence over the results of that evaluation (probably because this was a case involving learning – the predominantly inattentive dimension – and not behavior).

It is not surprising that school districts express a preference for their own experts and diagnostic tools, but it is not possible to document how often schools and medical experts use different diagnostic instruments. Still, my analysis of disputes suggests that school districts often use separate instruments to evaluate for learning disabilities (where schools document IQ – through an instrument such as the WISC-IV – and achievement – through an instrument such as the Woodcock Johnson Achievement Test) and for behavioral problems (through a broad-band instrument such as the Behavior Assessment System for Children (BASC), which measures a broad range of emotional, social, and behavioral problems (Brock et al., 2009)). The differentiation of the cognitive and the behavioral dimensions has implications for identifying ADHD if the use of those tests substitutes for the use of a narrow-band instrument designed to test specifically for ADHD. In one case, a school district was admonished for restricting its assessment to the BASC and not using "an ADHD

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[43] Continuous performance tasks are computerized assessments of attention-related problems that index the subject's performance in areas of inattentiveness, impulsivity, sustained attention, and vigilance. As noted above, most researchers in fact recommend the use of rating scales, personal observations, parent and child interviews, medical examinations, and psychological laboratory tests (such as the continuous performance tests) in diagnosing students with ADHD (Brock et al., 2009, p. 63). At the same time, it is recognized that the burden of such an approach can be cost prohibitive (Gualtieri and Johnson, 2005).

screening instrument."[44] The BASC, however, was mentioned as a diagnostic tool used by school districts in more than 100 cases, which represents the vast majority of the cases that discuss any specific diagnostic instrument. The BASC is about behavior, impulsiveness, disruptiveness, and less about "attention," which is harder to assess and harder to distinguish from academic weakness, unless by the SLD test, which does not always work in favor of the parents/child as shown in the Illinois case discussed above.

As shown in these cases, hearing officers and courts defer heavily to the expertise of teachers, even when teachers directly contradict the findings from neuropsychological evaluations (which usually account for teacher inputs). The next logical question is whether hearing officers and courts always defer to school district experts and, if so, what this tells us about the integration of medical knowledge within the legal system. Judges and hearing officers, in fact, do not always side with schools, but they exhibit considerable concern about the ramifications of broad deference to medical labels (particularly those obtained in apparent haste). Furthermore, hearing officers and courts tend to follow school districts unless it is clear that a ruling can be narrowly circumscribed. A case from Wisconsin provides an apt example of an effort by a hearing officer narrowly to define his ruling.[45] That case involved the expulsion of a student that had previously been classified as eligible for special education due to a learning disability. In the course of the evaluation that led to the student's eligibility, the school psychologist recommended that the student's parents might "want to consider having [the student] evaluated for a suspected Attention Deficit Hyperactivity Disorder." It is not clear whether the parents ever acted upon that suggestion. Over the course of his high school years, the student had many disciplinary referrals, so when vandals destroyed school property, the student was identified on a list of possible suspects. After the student admitted his role in the incident, the school district expelled

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[44] Redlands Unified School District, California State Educational Agency, Case No. SN03-00953A, June 18, 2003, 39 Individuals with Disabilities Education Law Report 249.

[45] Richland School District v. Thomas P., Case No. 00-C-0139-X, U.S. Dist. Ct., W.D. Wisc. May 24, 2000.

him, finding that vandalism was not a manifestation of a learning disability. The parents challenged that determination and hired a licensed clinical psychologist to evaluate their son. Based on interviews with the student and a review of his school records, including the school psychologist's prior evaluation, the student's private psychologist concluded that the student suffered from ADD and a mood disorder. In other words, in this case the parents want to utilize the misbehavior/impulsiveness side of the diagnosis, because of the reasons that led to the dispute. The student's psychologist testified that the student was considerably more impulsive than other students his age, and that the student's involvement in the vandalism incident was a manifestation of both of his disorders. I suspect that the student's parents asked the psychologist to use school records (rather than soliciting a new teacher rating scale) because they were concerned about asking the student's teachers to complete a rating scale during the disciplinary process. The school district challenged its own psychologist's earlier evaluation, which formed the basis of the evaluation of the student's independent psychologist, on grounds that it was not based on DSM-IV criteria.[46] The court rejected the school's argument, finding that there is no "magic formula" for diagnosing the disorder. Having said that, the court made a very pointed effort to say that the decision should not be read to equate misbehavior and ADD:

> This opinion should not be read to suggest that a student who commits reprehensible acts may avoid disciplinary action by running to a psychologist and obtaining a post-hoc diagnosis of attention deficit disorder. Despite what seems to be a trend towards equating bad behavior with ADD or ADHD, they are not one in the same. P. presented credible evidence to show that he is among the small percentage of the population that suffers from this disorder.

The concern with a post-hoc and cursory diagnosis is overcome in this particular case with the assurance that he was in a small group that actually suffered from ADHD. Whether this is true or not is debatable, but the court's concern about establishing a precedent that would encourage future litigants to seek medical diagnoses to excuse wrongful be-

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[46] It is worth noting that the school district takes advantage of a grey area in diagnostic practices, i.e., whether or not it is required to or allowed to apply DSM criteria.

havior likely was overcome by the fact that the school district's position was in tension with its own psychologist's evaluation (which suggests that the evidence of pre-incident onset, albeit undiagnosed, was crucial). What is interesting, however, is the manifest concern about narrowing the decision to this specific dispute.

To recap, medical dominance is contested when schools express a preference for their own experts and diagnostic tools, especially when confronted with the results of assessments performed by independent medical experts. But the relatively small number of hearings (given the huge numbers with the diagnosis) suggests that the diagnosis is accepted in the vast majority of cases. It is possible, of course, that some diagnostic disputes are resolved in mediation or even informally. Still, some hearings arise, and when they do, the veil of the medical diagnosis can be pierced. In most cases, the diagnosis coordinates the interests of the parties involved and hence a dispute is avoided. But the moment an ontological dispute arises, the diagnosis becomes much weaker, especially the cognitive psychology ontology of "attention," which is very hard to correlate to classroom realities (teachers have pedagogic expertise). In other words, ADHD is stronger as a flexibly-interpreted object that facilitates coordinated action without agreement about its ontology (Bowker and Star, 2000).

4.5.3 Eligibility

School districts can challenge eligibility not just by objecting to a medical diagnosis, but also by disputing the applicability of specific legal categories to students. Viewing the disorder as an instance of medical social control implies that schools are more likely to label students with behavioral problems than students who are underperforming academically. That view implies that a special education placement removes deviant children from general education classrooms, allowing schools to focus on the education of "normal" children. But the treatment of students with attention deficit disorders is more complex than the social control hypothesis would suggest. Legal disputes between school districts and parents suggest variability in outcomes depending on the type and severity of the symptoms. A significant number of disputes (approximately 15 percent of the due process hearings in the dataset) involved eligibility issues – either related to initial or continuing eligibility for services or the applicability of particular eligibility categories. In 7-8 percent of due process hearings, students were found ineligible for special education programs or services.

The rarity of disputes suggests that the ADHD diagnosis ordinarily is successful in translating the interests of the parties. That might be because the child's symptoms are severe enough that there is no dispute about eligibility or because they are mild enough with medication that no IEP is necessary. Hearings occur when the diagnosis is unable to translate the interests of the parties (and the parties have sufficient resources to pursue the disputes process). That typically happens when there are ontological disputes, especially when the ontology of "attention" is raised.

Schools manage these ontology differences, in part, through selective application of eligibility categories. Although the Department of Education amended federal regulations to make clear that the OHI category would apply to students with an ADHD diagnosis if they met the threshold condition of an adverse effect on "educational performance," the reality is that students with special education placements and ADHD diagnoses are placed in several categories – most commonly, SLD, ED, speech impairment, and OHI. Data from the ECLS-K (discussed in Chapter 3) show that in first grade, most of the students diagnosed with ADHD who had an IEP were in the speech-impaired or learning disabilities categories; by the third grade, most of the children were in the learning disabilities category. Data from the Special Education Elementary Longitudinal Study, a nationally representative study of students ages 6-12 receiving special education, show that the students with ADHD constitute the majority of students in the categories of ED and OHI; students with ADHD constitute one fifth of the students classified as mentally retarded or SLD. As to the distribution of students with ADHD across disability categories, roughly half were in the learning disabilities category (Schnoes et al., 2006). Wagner et al. (2003) reports comparable data from the National Longitudinal Transition Study-2 (NLTS2), a nationally representative study of students ages 13-16. Follow-up studies of the subjects in the MTA Study (when they were in high school) show the primary disability category for those who received services as "learning disability" for 46.4 percent, "ADD/ADHD" for 23.5 percent (an unrecognized category), and "emotional/behavior disorder" for 17.6 percent (Murray et al., 2014).

A 2002 case from California, involving a 13-year-old girls' eligibility for special education on the basis of an ADHD (inattentive subtype) diagnosis, illustrates the dynamic between the ontology of "attention" and classroom performance.[47] During the girl's early primary years, a school district found her eligible for special education services with an SLD, on the basis of a discrepancy between her ability (measured by I.Q. score) and achievement. The district provided services for several years; however, during fifth grade, the school psychologist administered a new psychoeducational assessment that suggested that the student's I.Q. score had fallen (from 89 to 80), as a result of which there was no longer a severe discrepancy between cognitive ability and achievement.[48] Based primarily on her grades, achievement scores, and the school psychologist's direct observations, the school district determined that the student's ADHD did not affect her educational performance (so she could not qualify as OHI). Constructing an opposition between medical and educational categories, the district argued that the student's use of the stimulant drug Adderall *should* have reduced the symptoms and thus obviated the need for special education. The school district thus acted as if the condition was fully medicalized so that educational remediation was not required. At a hearing challenging the eligibility determination, a psychiatrist's testimony on behalf of the student explained that ADHD impaired her executive functioning, which in turn impaired her memory and slowed her processing speed, all of which led to a "limited strength, vitality, or alertness in the classroom," in the words of

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[47] Manhattan Beach Unified School District, California State Educational Agency, Case No. SN02-01513, December 6, 2002, 38 Individuals with Disabilities Education Law Report 255.

[48] It is not clear from the opinion whether the score dropped because the test was renormed.

the OHI regulation. The student's expert also testified that although Adderall improves blood flow to the frontal lobes and helps the user to focus attention, it does not improve the executive functioning, which requires "practice, practice, practice." The student's sixth grade teacher confirmed that the student continued to exhibit symptoms despite taking a large dose of Adderall. Ultimately, the hearing officer found that the student's expert was "credible and well qualified to medically explain the relationship of ADHD to memory, processing speed, reasoning, and other aspects of mental functioning," as a result of which the hearing officer found that the student in fact was eligible as OHI. Although the hearing officer credited the neurological evidence over the school psychologist's testimony, the outcome likely depended on the fact that the student's special education teacher (who knew the student better than the school's psychologist) believed that the student required small-group, structured instruction and a modified curriculum. Thus, a conflict between school experts probably was outcome-determinative. But the fact that the dispute reached a hearing shows the difficulty in obtaining recognition for the medical consequences of a predominantly-inattentive ADHD diagnosis.

When a student's executive dysfunction issues manifest in minor disciplinary issues and few other overt symptoms, the case for eligibility can be difficult to make. In a 2002 case from Texas,[49] a hearing officer denied eligibility (agreeing with the school district) for a 13-year-old girl who was said to be progressing at "an average level commensurate with her intellectual capabilities." The student's multiple disciplinary referrals during seventh grade (mainly for tardiness and failure to attend detention) led to a concern that she was not advancing academically, in part because of missing class time while she was being disciplined for behaviors that were related to her disability. In this case, the student had never been found eligible for special education services, even though she was diagnosed with ADHD at the age of 5, but she had been found eligible for accommodations under

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[49] Gregory-Portland Independent School District, Texas State Educational Agency, Case No. 330-SE-0502, October 17, 2002, 38 Individuals with Disabilities Education Law Report 168.

Section 504 of the Rehabilitation Act and received preferential seating, simplified instructions on assignments, extended time for assignments, and assistance with organization. With those accommodations, the student maintained average grades in most subjects. The hearing officer denied eligibility for special education services, largely on the basis of her passing grades: "Understandably, [her] parents would like to see higher grades and a stronger showing of academic success; however the standard for educational need of special education services is not whether a student could do better, but whether a student is adequately progressing without the services." As to the parents' concern that the student was being disciplined for acts related to her disability, the hearing officer relied on a common narrative. The hearing officer agreed that the student was "at risk" for developing a disorder that could result in an educational need but found that at present her acts did not constitute a threat to her ability to benefit from a regular education program. In a similar New York case decided in 1994, a hearing officer upheld a school district's determination that an eight-year-old student's ADHD did not adversely impact his educational performance (for purposes of eligibility) despite testimony from a private psychologist that the student would be expected to encounter academic difficulty if her perceptual (cognitive) difficulties were not taken into account.[50] The student had the predominantly-inattentive subtype of ADHD, experienced some "processing issues" that were treated by stimulant medications, but was not significantly behind in school (at least as of the second grade).

In both cases, the parents were concerned about their child's ability to reach their potential, but the hearing officer sided with the schools based on the facts presented at the hearings. As shown in those cases, the "at risk" narrative represents a way for hearing officers to give school districts the benefit of the doubt as to the adequacy of a regular educational program until a student's representatives can present concrete evidence of the insufficiency of regular education – a burden that extended far beyond obtaining an ADHD

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[50] Board of Education of the East Syracuse-Minoa Central School District, New York State Educational Agency, Case No. 94-36, December 8, 1994, 21 Individuals with Disabilities Education Law Report 1024.

diagnosis. In those cases, testimony that behaviors were consistent with ADHD was not enough. These examples show how the ADHD diagnosis and associated medication can be molded to serve school needs/interests and explains why there are comparatively few disputes. They also show how the medication works to translate everybody's interests, allowing the parties to arrive at a provisional working arrangement (until it no longer works).

As shown, the cases that involve inattention are difficult because they do not fit easily into the SLD or ED categories. School districts prefer the SLD category, as shown during the hearings concerning the possible extension of the IDEA to students with ADHD. The hearings make clear that the reasoning for this goes beyond a simple desire to limit initial eligibility. Its constitution as an educational label also makes it easier to avoid due process requirements for student discipline. Conversely, where there is a pattern of significant behavioral problems, school districts apply the ED category because it connotes that the student's issues stem from emotional factors, justifying removal from mainstream environments. Parents, by contrast, tend to prefer the OHI label, the broadening of which they lobbied for successfully. This preference stems from the fact that OHI is the most closely synonymous with a medical category.

The school preference for the SLD category arises in part from the fact that learning disabilities are not characterized by behavioral problems (even though those problems sometimes occur if the student has a "comorbid condition"), as is shown a 2001 case from Texas.[51] That case involved a school district that had imposed numerous disciplinary removals from class and twice contacted law enforcement about the student's behavior. The school was aware of several evaluations by psychologists that diagnosed the student with ADHD as well as the student's long-term history of taking Ritalin. Yet the school district refused to qualify the student as OHI. Instead, they proposed to serve him only as a student with SLD, and they did not provide the student with a behavioral plan. By doing

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[51] Ingram Independent School District, Texas State Educational Agency, Case No. 232-SE-0401, June 11, 2001, 35 Individuals with Disabilities Education Law Report 143.

so, the district did not acknowledge (and was not confronted with) the possibility that the student's behaviors were manifestations of a medical disorder. Given the insufficiency of the district's approach and the student's longstanding diagnosis and medication treatment, the hearing officer ordered the district to classify the student as OHI and to provide a behavioral plan.

The preference for the SLD category also was apparent in a 2003 decision from New Jersey,[52] where despite repeated episodes of violence toward other children and adults, running from his classroom and hiding in the school building, sleeping under water fountains and destroying classrooms, a student's classification remained SLD. Numerous manifestation determinations had been decided against the student. When a due process hearing finally was requested, a hearing officer reversed a manifestation determination, admonishing the school district of the need to "check [their] egos at the door" because "if we don't intercept this child's needs at this juncture, how are we going to be able to address his escalating needs as he gets older and bigger and less easily managed and less easily controlled." This case had a similar outcome as the previous one, but it shows the business-as-usual approach of schools in dealing with student disciplinary problems.

Another reason for preferring the SLD category is that it is easier to declassify students with ADHD if they initially obtain eligibility in that category, as is shown in a case from New Hampshire.[53] A neurologist had diagnosed the student with "minimal brain dysfunction manifested by an attention deficit disorder" at age 7. She recommended to the student's pediatrician and parents a trial of Ritalin, but the student's parents did not believe that Ritalin should be used at that time. Through fifth grade, the student was classified as learning disabled. He was removed from special education when his achievement and IQ scores converged, even though his academic performance had deteriorated. The

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[52] South River Board of Education, New Jersey State Educational Agency, Case No. EDS873-02, May 12, 2003, 39 Individuals with Disabilities Education Law Report 88.

[53] Manchester School District, New Hampshire State Educational Agency, Case No. 90-60, December 6, 1990, 18 Individuals with Disabilities Education Law Report 425.

school attributed the student's worsening grades to poor motivation, because the student was not turning in assignments or finishing written work. He also tended to "fade out." School officials also suggested that the student use Ritalin (a case decided before the 2004 IDEA amendment that prohibited schools from insisting on medication). In a challenge to the school district's determination that the student was no longer eligible, the hearing officer held for the student, finding that the school district's personnel on the IEP team were predisposed to disqualify the student; the hearing officer ordered a new evaluation of student to determine the real source of his difficulties.

That case shows that school districts are not always successful in controlling the application of the SLD category, but the cases clearly show why the school districts prefer the category. It is easier to declassify the student because the school district's psychologist has full jurisdiction over the determination, in the sense that all of the information and assessments can be generated in-house. In addition, the substance of the category is educational, rather than medical – a terrain on which the parents (and their experts) are necessarily at a disadvantage. In the New Hampshire case, the parents of a student who was initially classified as learning disabled disputed the district's determination that their son was no longer eligible for special education services.

Another decision that raises a declassification issue involves an 18-year-old student from Vermont who had been diagnosed with ADHD and whose parents requested a residential program after their son's *third* unsuccessful attempt to complete the ninth grade.[54] Due to excessive absences, the student had been placed in the same grade for three consecutive years. He quit taking Ritalin because it exacerbated his Tourette Syndrome symptoms. The school district maintained that the student's poor academic performance was caused by a lack of motivation, not his disabling conditions (he had been found eligible in the SLD category some number of years earlier), and that the student should be held

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[54] In the Matter of a Child with Disabilities, Vermont State Educational Agency, Case No. 92-12, December 4, 1992, 19 Individuals with Disabilities Education Law Report 448.

accountable for his own education. Although the school district questioned eligibility, it offered 45 minutes each per day of resource room and counseling as a special education placement. The school district did not take into consideration the ADHD diagnosis given by the student's private psychologist because it had not been confirmed by a neurologist or other medical doctor. Based on expert testimony and the student's demonstrated lack of progress, the hearing officer held that the current IEP was inadequate to provide the student with an educational benefit and that the student required residential placement.

The case involved a narrative dispute: is this a story about neglect that turned into lack of motivation, or a story about lack of motivation for which post-hoc diagnosis is an excuse? The taking of medication plainly did not avert this dispute, but it is implied that the failure to do so is the parents' "fault" or that any residual problems are the student's "fault." This case turned on a battle of experts, but the student won. Over the years, the student had seen at least 5 specialists, one of whom (the first) said that he was poorly motivated. Two subsequent years of failure undercut that expert's testimony. In particular, the hearing officer concluded that the student's poor attendance record was a manifestation of his ADHD, combined with ineffective programming, and that any attempt to place responsibility on the student for his lack of academic progress was unacceptable. However, the hearing officer found insufficient evidence that the student had been denied an appropriate education during the previous two school years; he limited his order to the final year and required a residential placement for a period of one year. Essentially, the student was given one year to rehabilitate. The disagreement as to whether he is an underachiever or a student with a cognitive deficit (that contributes to poor motivation) will be tested by his progress in the residential placement. The student was given the benefit of the doubt because of the years of underperformance; this hearing officer simply did not wish to assume (given these extreme facts) that the medical explanation was invalid.

More often than not, however, these narratives are resolved in favor of school districts. A case involving a student whose failing grades and problem behaviors were attributed to

ADHD was not successful in a due process hearing because of her drug and alcohol addictions.[55] The hearing officer accepted the district's argument without considering the fact that drug and alcohol problems are associated with ADHD. In a similar case,[56] a "very, very smart" student's academic problems throughout elementary school were attributed to a choice not to do the work. In this case, the student's potential worked against him. When the student entered sixth grade, he was then found eligible as a student with an ED due to an escalation of "extreme outbursts" during school.

4.5.4 Placement

As demonstrated in the case of the 18-year-old Vermont student, disputes regarding the student's special education placement (referred to as an individualized education program, or IEP) remain common even when a school recognizes a medical diagnosis and finds that a student is eligible for special education. About 75 percent of the due process hearings involved placement issues – the type of school or classroom in which a student would be assigned, the type of services or personnel that would be provided, the type of accommodations that would be available,[57] or simply whether the programs and services specified in the IEP were being provided. The IDEA requires that schools provide a "free appropriate public education" to students with disabilities, but there is considerable disagreement

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[55] Elk Grove Unified School District, California State Educational Agency, Case No. N2005090739, February 22, 2006, 46 Individuals with Disabilities Education Law Report 56.

[56] Board of Education of the Oysterponds Union Free School District, New York State Educational Agency, Case No. 05-012, March 9 2005, 43 Individuals with Disabilities Education Law Report 98.

[57] Disputes about accommodations are relatively rare, but they do occur. In one case, for example, a high school student with ADHD who had average grades in a school of "hyper-achieving students" was given extended time for some school tests on an informal basis. For purposes of the Standardized Achievement Test, however, the Educational Testing Service considers whether a student has a formal Section 504 plan from the school district. The school district refused to formalize the student's plan, on the gounds that she was not disabled. Montgomery County Public Schools, Maryland State Educational Agency, Case No. DOE-MONT-02-03-27139, September 23, 2003, 40 Individuals with Disabilities Education Law Report 24. It is my anecdotal impression that school districts usually provide testing accommodations to students with documented medical diagnoses, simply because they have the infrastructure in place to readily accommodate those requests. The process used by the Educational Testing Service is documented at https://www.ets.org/gre/revised_general/register/disabilities/accommodations/.

about what placements are appropriate for students with ADHD.[58] Disputes arise primarily because the "prototype" special education programs that have been designed by educators and institutionalized within school districts – such as segregated schools or classrooms or resource room support – are too restrictive or provide little direct benefit to students with ADHD. In short, the programs that are most directly suited for students with ADHD are not always found within existing programs designed for students with "educational disabilities" – both because of institutional oversight or disinterest and because of difficulty providing those services in a common setting. Furthermore, school districts often treat learning and behavioral problems as separate issues, which is in tension with the medical understanding of ADHD.

What constitutes an appropriate program varies with the type of symptoms exhibited by the student and their severity, both of which are influenced by the mainstream school environment. Programs for students with ADHD fall into three general categories – accommodations, behavioral plans, and academic, social, or behavioral instruction or support.[59] Accommodations within the physical and learning environments of the classroom can benefit children with ADHD. The most commonly-used accommodations involve preferential seating and technology designed to assist with organization (a binder and daily

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[58] Follow-up studies of the subjects in the MTA Study (Murray et al., 2014) show that by high school 51.6 percent of the sample were receiving services through an IEP (47 percent) or a 504 plan (4 percent). Very few services (except tutoring) were provided outside of an IEP or 504 plan. Almost all students with services received some type of academic intervention, whereas only half received any behavioral support or learning strategy. Thirty five percent of students with ADHD spent time in special education classes; among those students there was a teacher's aide in addition to a teacher for 59 percent and a 1:1 instructional assistant for 8.3 percent. The most common accommodations were extended time on tests, progress monitoring, and additional time to complete assignments.

[59] This summary is derived from an OSEP report on teaching students with ADHD (U.S. Department of Education, 2008). Zentall (1993) summarizes accommodations uniquely targeted to students with ADHD. More recently, Harrison et al. (2013) distinguishes accommodations (changes to hold a disabled student to the same standard as non-disabled students), interventions (systemic processes to develop skills), and modifications (changes that reduce expectations). The authors note that accommodations take the form of changes in the way that instruction is presented, changes in the way that students are permitted to respond, changes in the location for completing assignments, and changes in the time allocated for assigments. Although several potential strategies are beneficial to children with ADHD, the authors conclude that there is very little evidence supporting the effectiveness of many commonly recommended accommodations for youth with ADHD.

check on use of the binder). If accommodations are successful, they reduce the need for more labor-intensive interventions in the academic environment. Behavioral interventions are strategies designed to help students learn how to control their actions; they include techniques such as verbal reinforcement of pre-defined behaviors, social skills classes, or one-on-one problem-solving sessions. Academic instruction includes practices such as frequent reviews of previous lessons, simplified instructions, use of oral and written directions with frequent follow-ups, lower noise levels in the classroom, smaller units of work, and reduction of timed tests. For children with ADHD who have language arts or math challenges, practices vary widely depending on level school but can include partner-reading activities, storyboards, playacting, mnemonics, memory skills, color coding of symbols, and any of the strategies designed for students with learning disabilities.

If a student is able to establish eligibility at a young age – which is not always easy (as discussed), it remains difficult to show that a particular program will not satisfy his or her educational needs. For young students, academic demands are relatively low, and school districts are likely to offer a limited intervention before moving to a more intensive (and possibly more restrictive) program. This is exemplified by a case involving a five-year-old with ADHD whose parents challenged a placement in a public school's regular kindergarten program that included special education support services but no "extended year" services.[60] The student's expert, a psychiatrist, recommended a summer school program because of the likelihood that any academic and social gains that accrued during the school year would be lost, as well as a full-day academic program with a low student-to-teacher ratio and a structured class environment. The school district, in turn, proposed a program with a 20-person class in a half-day, regular classroom, accompanied by an aide and the availability of a special education teacher across the hall. Finding that the district's proposed program was an appropriate placement, the hearing officer

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[60] Richfield Joint School District No. 1, Wisconsin State Educational Agency, September 9, 1991, 18 Individuals with Disabilities Education Law Report 168.

was influenced by testimony from the proposed kindergarten teacher to the effect that her classroom would be "structured" because all children need structure, not just those with ADHD. The hearing officer also relied on testimony that there was not yet any evidence that the absence of full-day program or an extended year would cause regression; at that point in the student's academic career, the psychiatrist's claim – based on experience with other children – was speculative. Although parents might be proactive in helping the child meet his or her potential, it is not surprising that school districts would have significant latitude to define appropriate programs. In short, at this early stage, it is commonly understood that all children benefit from structure and individualized attention, and children with ADHD – whose symptoms are only beginning to manifest as "warning signs" – have not had the occasion to fall far behind.

Placement issues become more complex as academic demands increase. A regular education placement with resource room services, for example, was found to be inappropriate for a second-grade student whose disability was known in kindergarten and whose performance had deteriorated since that time.[61] As a result of his declining performance, the student's parents enrolled their son in private school at Christmas break of the second grade year and sought reimbursement. The student's first-grade teacher apparently had been somewhat successful teaching the student even though his performance deteriorated somewhat. During the second grade year, the situation unraveled. The student began taking Ritalin, but the drug had inconsistent effects. The boy's parents claimed that he "cannot function independently in a classroom without constant teacher attention." They also brought the "potential" narrative into play, asserting that he is "very bright" but not working to his capabilities. The school acknowledged that it had placed the student in "the third reading group not because he was a poor reader, but because it was [the teacher's] opinion that he would be unable to do and complete the heavier writing assign-

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[61] Livingston Board of Education, New Jersey State Educational Agency, Case No. 90-3550, April 28, 1992, 18 Individuals with Disabilities Education Law Report 1070.

ments which were placed upon the students in the higher reading groups." Ruling in favor of the student, the hearing officer found that the resource room assignment was "misdirected" and accomplished "nothing more than a place for completing work." The fact that the student's potential was seen as high – by both parties – influenced the hearing officer's decision; the resource room and low reading group placement were not targeted to a student that had high potential but was in need of constant redirection.

Even when schools agree to an IEP that provides an appropriate program, disputes can arise if teachers refuse to implement it. An example of this involved an 8th-grade student from Massachusetts who had been diagnosed with ADHD and was receiving medication and special education services.[62] This student's disorder was characterized by math, auditory and visual memory, and visual-spatial deficits, as well as difficulty with written responses; she had strengths in verbal reasoning and social skills. Her parents preferred a placement at a private special education school, believing that she would thrive with small group instruction and support in all of her academic classes. But the student's IEP provided for small group instruction for her math class (her weakest subject), along with special education "support" in the regular education setting for her remaining courses. Her parents disagreed with the IEP, but also claimed that it was not being implemented in full; they emphasized that the effectiveness of this program was contingent on handpicked teachers who were able to modify the curriculum. The school district acknowledged that the school was not implementing the IEP in full but pointed to her good grades. The district also suggested that her teachers believed that singling her out (pursuant to the IEP) was stigmatizing. This hearing officer was concerned about the student's progress, pointing to the fact that her test and quiz grades were much lower than her overall grades.[63] The

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[62] Tewksbury Public Schools, Massachusetts State Educational Agency, Case No. 94-1344, April 20, 1994, 21 Individuals with Disabilities Education Law Report 582.

[63] Because of the frequency with which grades are used to show progress, there is OSEP guidance on this point. In Questions and Answers on the ADA Amendments for Students with Disabilities Attending Public Elementary and Secondary Schools, the Office of Civil Rights, the OCR made clear that "[s]chool districts should not assume that [a] student's academic success necessarily means that the student is not substantially limited in a major life activity," meaning that "grades alone are an insufficient basis upon

hearing officer ruled in favor of the school district, however, because the private special education school was too restrictive. The hearing officer ordered the school to amend and follow a new IEP that would require multisensory teaching, use of mnemonics, teaching in smaller segments, close monitoring of the student's focus, and use of drill and repetition. In denying the parents' preferred placement, the hearing officer was influenced by the girl's "significant strengths." Here, the student's high potential works against the restrictive placement.

In the Massachusetts case, the school district provided a program (that it refused to implement) designed to remediate learning issues without specifically addressing attention issues. This approach arises directly out of the tension between the medical category ADHD and "learning disabilities" (which, for educators, encompass all perceptual issues). In a similar case, a school district proposed an IEP for a 7th-grade student from Massachusetts with an ADHD diagnosis and eligibility through the SLD category.[64] The IEP placed the student in a school with a small language group and supports for other classes in the form of tutoring for three days a week, a full time aide, and speech therapy twice a week. The student's parents rejected the IEP, requesting that the district place the student in a private, residential school. The parents unilaterally placed the student in the residential school and requested a due process hearing. The evidence showed that the student had increased difficulty with his academic work throughout his elementary years, but he managed to get by with tutoring. His problems escalated in sixth grade. The school district had been aware of the student's academic problems in his regular education classes

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which to determine whether a student has a disability." Grades are just one factor and do not provide information on how much effort was required for the student to achieve those grades. The Committee on Education and Labor in the House of Representatives cautioned that "an individual with an impairment that substantially limits a major life activity should not be penalized when seeking protection under the ADA simply because he or she managed their own adaptive strategies or received informal or undocumented accommodations that have the effect of lessening the deleterious impacts of their disability." See H.R. Rep. No. 110-730, pt. 1, at 15 (2008). This guidance emphasizes the possibility that students with neurological impairment are required to expend additional effort to achieve their grades. As the Massachusetts case suggests, an additional concern is the fact that grades are within the control of schools.

[64] West Boylston Public Schools, Massachusetts State Educational Agency, Case No. 97-0118, April 11, 1997, 25 Individuals with Disabilities Education Law Report 920.

for several years, but continued to place him in regular education classes. The student's grades fell in sixth grade – from passing to all D's and F's by the end of the year. The hearing officer found that both programs were inappropriate. The school district's program did not address the student's attentional and organizational deficiencies. However, the parents were not entitled to reimbursement for the costs of the private school because it was too restrictive for the student, which was demonstrated by the fact that the student made no progress during the period between the placement and the hearing. Put simply, the law restricts the parents' ability to resolve a tradeoff between mainstreaming and the need for frequent redirection.[65]

Besides placing students with inattentive symptoms in learning disabled-type placements (i.e., tutoring, language support, etc.) that are not tailored specifically to the attention and organizational weaknesses of students with ADHD, school districts also treated learning and behavioral problems as separate issues. This differentiation contradicts the medical understanding of ADHD as a hybrid disorder. The consequences of being placed in programs for children with behavioral problems caused several parents to dispute the primacy of particular symptom groupings. There was a case from Pennsylvania in which the student's parents challenged a proposed placement in a combination learning disability/emotional disturbance program; they preferred a full-time classroom for students with learning disabilities.[66] The parents believed that the classroom with students with emotional difficulties would expose their child to a high level of stimulation that would impair his ability to learn. As a result, they removed him from the public school and placed him

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[65] Although my views are anecdotal, private schools often use the same approach as public schools in responding to behavioral and cognitive problems. Children with primarily academic issues are treated as a group. Those schools/programs are staffed heavily with reading specialists, speech therapists, and they rely heavily on assistive technologies. Children with primarily behavioral issues are treated as a separate group. Those schools/programs are staffed heavily with counselors and social workers. They emphasize social skills training, counseling, and behavioral management. The main differences between private special education schools and public schools are that private schools allow few or no mainstreaming opportunities, but they often have smaller class sizes, making redirection of students with attention disorders less burdensome.

[66] Lauglin v. Central Bucks School District, Case No. 91-7333, U.S. Dist. Ct., E.D. Pa., Jan. 11, 1994.

in a private school. The school district claimed that the boy's severe emotional and behavioral problems went far beyond that of a typical ADHD child and that the proposed placement was appropriate. His parents argued that their son's severe emotional and behavioral problems were attributed to poor management of his ADHD, and that if placed in an LD setting, his conduct problems would be less severe (apparently he was easily distracted by the "acting out" of other students). Several experts for the student testified that his conduct problems were secondary to ADHD. The hearing officer accepted the causation narrative offered by the school district and thus ruled in its favor. The hearing officer pointed to evidence that over 60% of children with ADHD also have Oppositional Defiant Disorder or Conduct Disorder (implying that he likely had one of those conditions as well). The hearing officer also pointed out that DSM-III-R (in effect at the time) did not classify ADHD as a learning disability but as a disruptive behavior disorder.[67]

The issue of primacy of symptoms came up in a case involving a seventh-grade student from Indiana who was diagnosed with ADHD, had serious emotional problems and low average to average intelligence, and experienced increasing difficulty in school throughout his elementary school years.[68] The student began having trouble keeping up with his homework in fourth grade. His parents started investigating special educational programs during his fifth grade year, but his academic and behavioral problems escalated upon entering middle school. As a result, his time in a resource room increased in sixth grade. He also was supposed to receive daily support in the regular language arts and math classes. When he continued to regress – becoming withdrawn, fighting, failing to complete assignments and to review for quizzes – and the district proposed the same program for seventh grade, the parents obtained independent assessments and ultimately enrolled him in a private school. The school district claimed that the student's primary disability was emo-

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[67] Recall that the re-classification of ADHD as a learning disorder, and not as a behavioral disorder, was one of the changes made in DSM-5.

[68] Parents of Matt A. v. Valparaiso Community Schools, Case NO. 2:95-CV-295, U.S. Dist. Ct., N.D. Ind., Jan. 30, 1997.

tional. The witnesses for both sides agreed that he had serious emotional and behavioral problems; they disagreed on whether those problems were caused by frustration resulting from his other disabilities or whether they existed independently. Although witnesses on behalf of the student testified that his problems likely would be "triggered" by other children with significant behavioral concerns, the hearing officer discounted that testimony because both sides agreed that it was difficult to disentangle the boy's attention deficit disorder from the emotional problems. For children with behavioral problems, schools seem to relegate the attention problems to the background, thus interpreting the category in a quite different way than the medical diagnosis would contemplate.

A similar issue reached the Ninth Circuit in 1995, when a 16-year-old student with a learning disability, attention deficit disorder, and conduct disorder was unilaterally placed by his parents in a private school.[69] The student was eligible for special education under the SLD category. He had a history of poor academic performance and bad behavior and had been hospitalized for a period of time for aggression. After the student received failing grades in a program that combined regular education classes with a resource specialist, the district implemented a program of special education classes with resource services, and once again, the student failed. Immediately before his private placement, the district responded with yet another IEP that reduced the time he spent in special education–despite his failures under the former programs. The school district's main expert witness, the school psychologist who had assessed the student, testified that ascribing the boy's poor performance to a neurochemical deficiency was "overly speculative" because Ritalin therapy did not provide the relief from symptoms he would have expected if there were a neurochemical imbalance; the school psychologist further claimed that the boy's problems stemmed from the conduct disorder (which was not a basis for eligibility on its own). A due process hearing officer determined that the district had denied the student an appro-

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[69] Capistrano Unified School District v. Wartenberg, 59 F.3d 884, U.S. Court of Appeals, Ninth Circuit, July 5, 1995.

priate education, which justified reimbursement for the private placement. The decision was affirmed on appeal by the district court and the Ninth Circuit. School and private psychologists agreed that the student needed structure and individualized attention; the hearing officer and courts found that the use of four to six different teachers and three different resource specialists in the school district's proposed program would not provide that structure. They were also influenced by the fact that the student did better academically after transferring. The use of a behavior plan with immediate consequences was improving his behavior. The conduct disorder was not seen as the principal cause of his symptoms because there was evidence that he had attention problems dating back to early in his schooling. And many of his teachers agreed that his "negative behaviors stem[med] from his attention-deficit disorder and his resultant school failure, depression, and feelings of inadequacy."

In sum, issues with placement decisions often relate to the fit of pre-packaged programs designed by educators (that do not target attention issues) to the needs of students with ADHD. School interpretations of ADHD thus are shaped by the existing programs offered by school districts.

4.5.5 Consequences

In addition to diverging opinions about whether inattentiveness provides a medical explanation for poor motivation, parents and schools disagree about whether impulsivity provides a medical explanation for behavior sufficient to excuse a student's misconduct. Discipline issues were involved in about 20 percent of the due process hearings in the dataset. Many of those discipline cases involved the question whether an act of misconduct that led to some disciplinary action was a manifestation of the student's disability. As discussed in Chapter 2, there is a positive relationship between the level of student discipline and the prevalence rate for ADHD, despite the assertions of some researchers that a diagnosis is an alternative to disciplinary action. The ability to use medical knowledge about ADHD to excuse behaviors that otherwise would result in discipline largely explains that aggregate-level relationship. Even though I found that parents prevailed in relatively few of the reported decisions, the threat of due process likely has a substantial chilling effect on school district approaches to discipline.

Some disputes arise at the intersection of school discipline and the juvenile justice system. A case that highlights this issue came from the Sixth Circuit's review of the dismissal of a juvenile court petition.[70] After a middle-school student vandalized a school bathroom, a Tennessee school district filed a juvenile court petition against the student. The student had a long history of misbehavior and failing grades, and the school district was aware that he had been diagnosed with ADHD and that he was receiving medication for his condition. Before the incident, the school district had been in the process of assessing the student for special education services. A few days after the juvenile petition was filed, the school district held a disciplinary hearing, which also served as a meeting where the school certified the student as eligible for services. At that meeting, the school determined that although the student's destructive behavior might be related to his disability, his "unauthorized presence" in the restroom was not. The juvenile court petition was dismissed by an administrative law judge on procedural grounds: because the property destruction was related to his disability, the juvenile petition constituted a change in placement without following proper procedural safeguards. A district court upheld the dismissal of that petition, and the school appealed. The Sixth Circuit viewed the juvenile petition to be the "culmination of a long series of disciplinary actions taken against him by the school system despite their awareness of a disability and his deteriorating grades and behavior." Since the filing of a juvenile petition against the student triggered a change in placement, regardless of whether it resulted in incarceration, he was entitled to receive a multidisciplinary team meeting from the school district before a juvenile petition could be filed.

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[70] Knox County Pub. Sch. v. Chris L., 106 F.3d 401, U.S. Court of Appeals, Sixth Circuit.

The Tennessee case was decided based on a fact pattern of a period of neglect followed by an extreme sanction. Many other cases (criminal and non-criminal) discuss what it means for behavior to be a manifestation of ADHD. In a Colorado case from 1994, a 17-year-old student with ADHD was expelled from school after an indecent exposure to a female classmate.[71] The boy's parents requested a due process hearing to contest the expulsion. By the time of the hearing, the student had pled guilty to a criminal charge based on the incident and was sentenced to a juvenile diversion program. The hearing officer found that the student did not qualify for special education at the time of the hearing or at the time of his expulsion. Like the boy from Tennessee, he had a history of poor grades, but the hearing officer found that his grades appeared to result from lack of interest and conflicts with teachers. Moreover, the hearing officer found that the incident in question was not symptomatic of the type of conduct that characterized ADHD. Although an expert for the student testified that the incident resulted from poor impulse control, the hearing officer found that this was not an "uncontrollable, inappropriate type of outburst that 'lack of impulse control' connotes to the hearing officer, in the neurological sense." The act "was intentional: a plan was involved, as was the execution of several steps to carry it out." This was not a case where the consequences of the act were not considered, but one where the actor "simply had no respect for the consequences." The hearing officer remarked that "[i]t would similarly do a disservice to the usefulness of 'attention deficit disorder,' as a scientific term describing a specific condition, if it were expanded to cover any and all types of aberrant conduct." The hearing officer was influenced by the student's failure to take medication, observing: "The finding is similarly inescapable that during those years when Petitioner was on Ritalin, both his grades and test scores were substantially better than they were when he was not taking medication. Petitioner's parents, and Petitioner himself, do not believe in taking drugs to control behavior, however, and have not persevered

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[71] Academy School District #20, Colorado State Educational Agency, Case No. L94:119, October 26, 1994, 21 Individuals with Disabilities Education Law Report 965.

with medication regimens when prescribed." The desire to punish the student (and his parents) for refusing to continue a medication regime was clear: the boy and his parents were blamed for the lengthy history of misconduct.

It is common to point to evidence of deliberation to justify a finding that behavior is not symptomatic, but it is difficult to distinguish acts of impulsivity and acts of simple (non-neurological) bad judgment; in other words, does a series of antecedent impulsive acts undermine the ability of students to explain behavior in medical terms. For example, in another Colorado case, the theft of money by a middle school student from an unlocked file drawer was not a manifestation of his disability because testimony indicated that the student planned the theft for more than a day before carrying it out.[72] And in a 1997 Georgia case, bringing a firearm in a car parked on school property was not a manifestation of the student's disability because it demonstrated "poor judgment" and not impulsivity.[73] Similarly, the decision to detonate a "dry-ice" bomb was not impulsive because of the research required to construct it.[74] Likewise, a fight following a basketball game was not an impulsive act because it had been planned.[75] A California due process hearing officer, on the other hand, found that keying a car owned by the high school principal (in response to peer pressure) was an act of impulsivity.[76] And in a 1999 case from Minnesota,[77] a hearing officer found that bringing an unloaded paintball gun on the school bus was impulsive because the decision to act was spontaneously made in response to a request by

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[72] Academy School District #20, Colorado State Educational Agency, Case No. L2002:111, August 12, 1992, 37 Individuals with Disabilities Education Law Report 264.

[73] Oconee County School System, Georgia State Educational Agency, Case No. OSAH-DOE-SE-98-022-46, October 2, 1997, 27 Individuals with Disabilities Education Law Report 629.

[74] Poway Unifed School District, California State Educational Agency, Case No. 2010060622, July 27, 2010, 55 Individuals with Disabilities Education Law Report 152.

[75] Fallbrook Union High School District, California State Educational Agency, Case No. SN05-00383, March 28, 2005, 43 Individuals with Disabilities Education Law Report 159.

[76] Sequoia Union High School District, California State Educational Agency, Case No. SN392-01, April 6, 2001, 34 Individuals with Disabilities Education Law Report 303.

[77] Independent School District No. 279, Minnesota State Educational Agency, Case No. 78-2103-12203-3, May 28, 1999, 30 Individuals with Disabilities Education Law Report 645.

another student. The intervention of other students in the latter two cases worked in favor of the diagnosed students. The boundary drawing problem here is central: educators (and the judicial process) do not wish to defer reflexively to medical explanations for behavior. Medical expertise purports to lend a scientific (or objective) explanation for what educators understand to be poor judgment of a sort that adolescents commonly exhibit without regard to any disability. The cases are reminiscent of the problem that psychology poses for criminal law (Valverde, 1998).

4.6 Conclusion

This chapter documents a tension between educational and medical approaches to handling the symptoms of inattention, impulsivity, and hyperactivity in the context of the legal system – one of the major arenas in which jurisdiction claims are made (Abbott, 1988). Prior work does not examine the conflict between medicine and education, because it assumes that educators do not or are not able to challenge the free movement of medical categories through educational institutions. However, the hearings, which take the form of disputes about eligibility, placement, drug use, and student discipline, document clashes between medical and educational points of view. The reconciliation of medical and educational approaches within the legal system reveals a re-configured object — one that balances the individualizing and objectifying tendencies of medical knowledge with the equitable and remedial functions of education and law. More broadly, I show that what ADHD means in practice is determined by interaction among doctors, the medication, children, parents, teachers, school administrators, lawyers, hearing officers and legislators. These actors apply different logics, and the category moves through different institutions, but the resulting object is sufficiently stable to provide a means of communication and sufficiently flexible to allow for different interpretations (Bowker and Star, 2000).

The clashes provide evidence of the normal state of affairs in which the use of the

ADHD category in schools is regulated by educational authorities, so that they can avoid "medicalization" and protect their jurisdiction. They document a tension between a medical category that assumes that a heterogeneous set of symptoms stem from a central neurological processing deficiency and an educational category that sees behavioral and cognitive symptoms (and the children that exhibit them) through separate lenses. Differentiating children with primarily behavioral or cognitive symptoms allows educators to develop programs that provide a better fit to teacher training, respond to needs for classroom discipline, and facilitate the different needs of children. Teachers and schools embrace medication as a way to treat symptoms, and there is evidence of medicalized approaches by schools in dealing with behavioral issues. But educators typically reinterpret the medical category as it pertains to the ontology of "attention." In sum, educators do not concede jurisdiction to medical professionals; rather, they use the medical category strategically.

Conclusion

When Leon Eisenberg (the researcher that performed the first scientific drug trials in child psychiatry in the 1960s) died, his obituary in the *New York Times* (Carey, 2009) highlighted two interesting facts. One, Dr. Eisenberg was deemed "courageous" by Keith Conners (another early drug researcher) for denouncing the psychoanalytic approach to treating children, an approach that favored "rich kids" and was unscientific. Two, Dr. Eisenberg had become disenchanted late in life with the use of the ADHD diagnosis because it "morphed from a relative[ly] uncommon condition ... to one whose current prevalence is 8 percent" [and growing] for no "self evident" reason.[1] In other words, what started as an effort to use science to reach those children that psychoanalysis and schools were failing to reach evolved into something that benefits wealthier families whose children need to enhance their performance in schools. How this happened is the story of my dissertation.

I argue that ADHD prevalence has increased during the past two decades to an extent far beyond any level that environmental factors can explain and at a time and place that is inconsistent with medical imperialism. As shown in Chapter 1, the category did not emerge when conditions were optimal for a medicalization process to occur. Research on children in institutional care in the 1930s and 1940s identified a connection between brain damage and emotional and behavioral abnormalities, discovered the calming effects of stimulant drugs on hyperactive behaviors, and developed a way to use technology to link drug responses to neuroanatomical features of the brain. At that time, there was no serious opponent to medical expansion. But the category did not emerge for nearly half a century – not until the power of the medical profession had diminished considerably.

The formation of new identities around disability shaped a milieu in which the disorder could thrive (Lakoff, 2000). When deinstitutionalization returned children with severe mental illnesses or developmental disabilities to public school systems, new ways of educating children with those conditions had to be developed. In addition, new categories of

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[1] According to the New York Times, Dr. Conners referred to the rising diagnostic rate at a recent medical conference as "'a national diaster of dangerous proportions"' (Schwarz, 2013b).

school-specific disabilities were created in response to the federal government's increased role in education. The effort to ensure equal access to schooling and to raise achievement levels led to the problematization of unexplained underachievement – specifically, underachievement that could not be explained by intellectual deficits or poverty. This was the specific precursor to the new categories of hyperkinesis and learning disabilities – both of which formed as alternatives to the minimal brain dysfunction (MBD) category. Where the former category was of little use outside of the institutional context, these new school-specific disabilities extended the reach of disability identities to new groups of children.

The advocates of hyperkinesis and learning disabilities pursued different goals and represented different constituencies. The learning disabilities category was carved out first in the political arena and became a part of the special education legal regime. It responded to the problem of unexplained learning challenges affecting children from high socioeconomic status backgrounds. The hyperkinesis category initially responded to the problem of hyperactivity in boys from low socioeconomic status backgrounds, in part because of a perceived improvement in the activity levels of children that used stimulant drugs (and were unable to afford psychoanalytic treatments). Hyperkinesis later evolved into attention deficit disorder, which officially entered the psychiatric lexicon in 1980. The renaming of the disorder resulted from the involvement of new groups of experts – psychologists, neuropsychologists, and other medical professionals – who came to view attention as the core deficit of the syndrome. Ultimately, the trajectories of the two disorders reversed: learning disabilities became a residual category for poorer children who were shifted out of the mental retardation category as a result of legal pressure to limit its application (Ong-Dean, 2006), while attention deficit disorders became a category associated with performance enhancement of high-income, white children. Drug studies reached progressively broader groups of children as researchers became interested in the problem of medical solutions to learning difficulties, and the psychologists and other new medical specialists began to focus on the cognitive aspects of attention. As a result, the demographics of the category began to shift towards high SES students, particularly as parents began to identify with the label themselves.

The introduction of Medicare and Medicaid in the 1960s also played a role in the development of the medical category. When the federal government began to assume an increased share of responsibility for the costs of mental health care, the biological/categorical approach to mental disorders was adopted (Mayes and Horwitz, 2005). This led to increased reliance on pharmaceutical treatments rather than psychoanalytic care aimed at the wealthy. Although psychiatrists had advocated for the use of stimulant drugs to treat hyperactive children who could not afford other remedies, drugs were not seen as an exclusive remedy until the 1990s. I show in Chapter 2 that the hypotheses that form the core of the medicalization argument are not supported by empirical data. Prevalence and treatment are not associated with physician density or marketing regulation. Moreover, white and high-income students are the groups most likely to use drugs as stand-alone treatments. Although parents appear to be a key driver of diagnosis and stimulant drug use, their selective use of stimulants (particularly among the economically advantaged) (King et al., 2014) undermines the claim of medical dominance and suggests collaboration instead (Moreira, 2006).

In Chapters 3 and 4, I show that the success of the category is attributable to the particularities of the institutions in which the diagnosis is embedded. Medical recognition provides a way through which parents can challenge the way their children are treated at school and in other institutional settings, so the ADHD diagnosis and the medication treatment usually are successful in translating the interests and coordinating the actions of schools, teachers, parents, and children. The conception of expertise that underlies the disorder, however, is distributed across these actors and is jointly maintained among them. Looping effects are also part of the network. Although experts created the classifications MBD, hyperactivity, attention deficit disorders, and so on, the patients/consumers make them their own, and experts ultimately must confront the new types of patients by making additional changes to the diagnostic criteria. I show that those changes, in turn, can act on patients/consumers, affecting the age characteristics, the gender ratio, the socioeconomic divide, etc. Moreover, it is clear that a better understanding of the category can lead to a greater likelihood of agreement among caretakers (such as the fact that hyperactivity is a characteristic of young boys), making it more likely that behaviors of boys are identified as hyperactive and treated as requiring medical intervention. Furthermore, although medicalization portrays the disorder as a reaction to disruptive behavior in schools, I show in Chapter 3 that it is used by economically advantaged students as a cognitive disorder that helps them to respond to relative weaknesses in schools where demands are higher. This means that students in wealthier schools are more likely to be diagnosed.

Although the medical category ADHD is an object flexibly used in different ways by medical professionals, insurance companies, the criminal justice and civil justice systems, parents and schools, medical expertise is not. Rather, medical knowledge disrupts educational practices, whether related to assessments, eligibility determinations, programming, or school discipline. The version of medicalization theory that claims that wealthy parents are simply engines of medicalization is difficult to reconcile with the fact that the category ADHD is not strictly medical; it is shaped in schools into an object that includes educational and medical understandings of children's behavioral and cognitive problems. Educators have not conceded jurisdiction over childhood cognitive and behavioral problems to medical explanations or experts, except when doing so fulfills educational needs, as shown in Chapter 4. Accordingly, although the medical frame was a "starting point of an analysis, a sign of the need for an analysis, ... it should not be the conclusion of [the] analysis" (Rose, 2007, pp. 701-702). As I show, the spread of the medical category ADHD in fact says little about the way that the category is used by parents and children.

This study has several limitations. The large, nationally-representative datasets used in Chapter 2 do not allow for exploration of school and community effects. Nor could I use those data to answer questions about symptoms and their relationship to diagnoses and treatment. The dataset used in Chapter 3 allowed for examination of symptoms, schools factors, and longitudinal trajectories, but the small sample sizes undermined the ability to obtain accurate estimates of many of the macro-level factors contributing to diagnosis and treatment. The gaps between waves made it difficult fully to understand the process through which relative deficits in the classroom led to diagnoses and treatment. Furthermore, both of those analyses show that parents are active in securing diagnoses and medical treatments, but they leave open the possibility that parents are merely "drivers" of a medicalization process. In other words, neither of those quantitative analyses fully respond to the question of whether the institutionalized category – as opposed to the medical category – is truly "medical." Furthermore, the quantitative studies are dated: they do not account for diagnostic practices after DSM-5. The examination of disputes in Chapter 4 is useful for observing the nature of clashes between parents and schools, but the relative infrequency of hearings means that we know little about what happens in the absence of a legal dispute. Future qualitative research is needed to understand how and under what conditions teachers respond to deficiencies in the non-cognitive skills of students, how and under what conditions teachers begin to ascribe medical causes to those deficiencies, and how, how often, and under what conditions disputes with parents begin to unfold.

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APPENDIX

The first two editions of the Diagnostic and Statistical Manual of Mental Disorders (DSM), published by the American Psychiatric Association in 1952 and 1968, preceded the rise of biological psychiatry (First, 2010). DSM-I included the subcategory, Adjustment Reaction of Childhood, listed in the Personality Disorders category under the title Transient Situational Personality Disorders. The subcategory was divided into three disorders – habit disturbance, conduct disturbance, and neurotic traits. DSM-I did not refer to disorders of inattention, impulsivity, or hyperactivity, but identified “learning disturbances” as one of several “special symptom reactions,” along with speech disturbance and enuresis.

In DSM-II, “conduct disturbance” disappears. A new section, “Behavior Disorders of Childhood and Adolescence,” describes seven behavior disorders: hyperkinetic reaction, withdrawing reaction of childhood, overanxious reaction, runaway reaction, unsocialized aggressive reaction, group delinquent reaction, and other reaction of childhood or adolescence. DSM-II defined the diagnostic criteria for hyperkinetic reaction as follows: “This disorder is characterized by overactivity, restlessness, distractibility, and short attention span, especially in young children; the behavior usually diminishes by adolescence.” This definition was followed by one sentence concerning differential diagnosis: “If this behavior is caused by organic brain damage, it should be diagnosed under the appropriate non-psychotic organic brain syndrome.” With this differential diagnosis requirement, organic brain damage was no longer presumed, and in fact cases associated with organic brain damage were specifically excluded. The label hyperkinetic reaction syndrome reflected the understanding that hyperactivity was a central symptom that was characteristic of children commonly referred to child guidance clinics (Russell, 1942; Childers, 2009). DSM-II described “learning disturbances” as “specific learning disturbances” and still listed them as “special symptoms.”

The following table displays changes in the DSM across seven important dimensions, starting with the definition of “attention deficit disorder” in DSM-III, published in 1980.

	DSM-III (1980)	DSM-IIIR (1987)	DSM-IV (1994)	DSM-IVR (2000)	DSM-5 (2013)
Category	attention deficit disorder	attention-deficit hyperactivity disorder	attention-deficit/hyperactivity disorder	same	same
Section heading	disorders usually first evident in infancy, childhood, or adolescence–attention deficit disorder	disorders usually first evident in infancy, childhood, or adolescence–disruptive behavior disorders	disorders usually first evident in infancy, childhood, or adolescence–attention-deficit and disruptive behavior disorders	same	neurodevelopmental disorders
Symptom grouping	2 subtypes: ADD with and without hyperactivity. 3 symptoms of inattention, 3 symptoms of impulsivity, 2 symptoms of hyperactivity (for combined subtype)	single list of 14 symptoms (8 required for diagnosis)	2 subtypes: inattention and hyperactivity-impulsivity. 6 symptoms for either subtype	same	Presentations–children must have 6 symptoms per presentation Adults need at least 5
Severity	"for his or her mental and chronological age, signs of developmentally inappropriate inattention, impulsivity, and hyperactivity"	"behavior is considerably more frequent than that of most people of the same mental age"	"to a degree that is maladaptive and inconsistent with developmental level"	same	"to a degree that is inconsistent with developmental level"
Age of onset	7	same	same	same	12
Settings	"the signs must be reported by adults in the child's environment, such as parents and teachers"		"some impairment from the symptoms is present in two or more settings (e.g., at school [or work] and at home)"	same	"Several ... symptoms are present in two or more settings (e.g., at home, school, or work; with friends or relatives; in other activities)"
Impairment			"clear evidence of clinically significant impairment in social, academic, or occupational functioning"	same	"clear evidence that the symptoms interfere with, or reduce the quality of, social, academic, or occupational functioning"
Differential diagnosis	"not due to schizophrenia, affective disorder, or severe or profound mental retardation"	"does not meet the criteria for a Pervasive Developmental Disorder"	must "not occur exclusively during the course of a Pervasive Developmental Disorder, Schizophrenia, or other Psychotic Disorder" and "not better accounted for by another mental disorder"	same	must "not occur exclusively during the course of schizophrenia or another psychotic disorder" and not "be better explained by another mental disorder"

Table A.1: Symptom-Based Approaches to Diagnosing Attention Deficit Disorders (1980-present)

Figure A.1: Map Showing Geographic Variation in ADHD Prevalence, Prescription Drug Use, IEP Status, and Prescription Drug Type Conditional on Diagnosis, Ages 4-17. Source NSCH 2011.

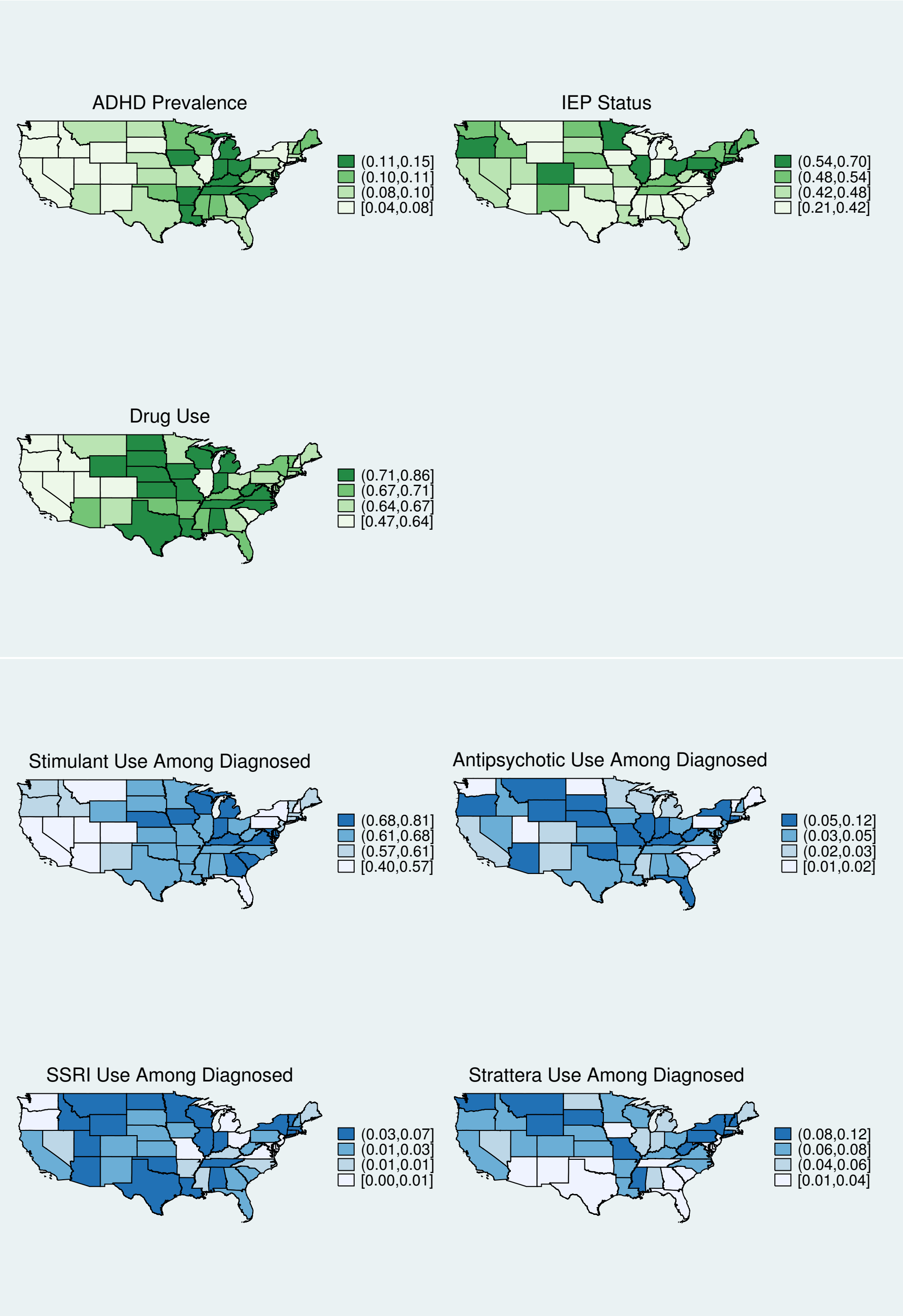

Figure A.2: Co-Morbid Conditions, by Race, for Children, Ages 4-17, with an ADHD Diagnosis. Source NSCH 2011.

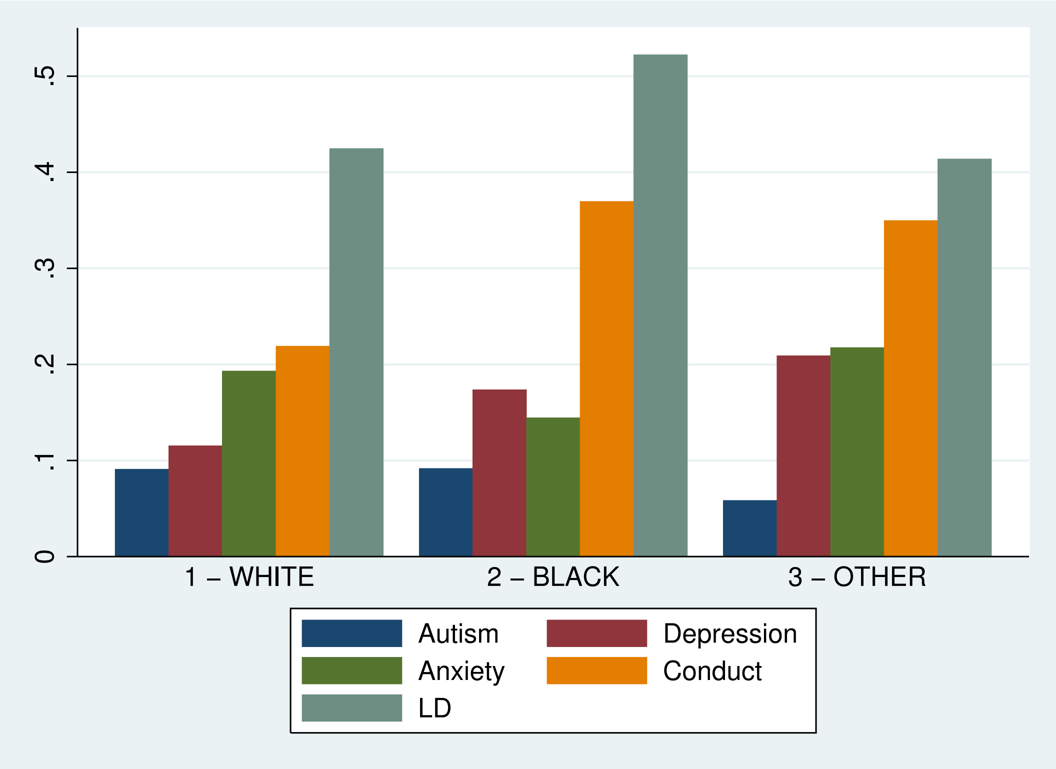

Table A.2: Distribution of State Education Agency Decisions by State

State	Number of Decisions	State	Number of Decisions
Alabama	61	Mississippi	2
Alaska	4	Missouri	8
Arizona	8	Montana	1
Arkansas	19	North Carolina	6
California	145	New Hampshire	16
Colorado	7	New Jersey	37
Connecticut	31	New Mexico	4
District of Columbia	4	New York	163
Delaware	10	Nevada	2
Florida	14	Ohio	6
Georgia	27	Oregon	25
Hawaii	11	Pennsylvania	100
Idaho	1	Rhode Island	2
Illinois	40	South Carolina	4
Indiana	16	Tennessee	8
Iowa	15	Texas	138
Kansas	6	Utah	2
Maine	27	Virginia	11
Massachusetts	95	Vermont	14
Maryland	36	West Virginia	2
Michigan	20	Washington	10
Minnesota	29	Wisconsin	17

Table A.3: Distribution of State Education Agency Decisions by Issues in Dispute

	# Cases
Eligibility	
Child find	30
Evaluations	162
Other eligibility	159
Placement	
Accommodations	7
Assistive technology	6
Compensatory education	28
ESY	12
Extracurricular activities	5
Implementation of IEP	27
Personnel	5
Programs and services	419
Private school costs	182
Discipline	
Behavior plan	10
Manifestation determinations	76
Other discipline	144