Section 1 The development of adult ADHD as an epidemiological concept

Chapter 1

The course and persistence of ADHD throughout the life-cycle

Joseph Biederman

An important step in understanding the significance and therapeutic needs of psychiatric syndromes is documenting the course of the disorder. Those individuals who have chronic forms of disorder generally suffer greater consequences as a result, have more severe forms of disorder, and require the most aggressive intervention. Over time, the perception that attention-deficit hyperactivity disorder (ADHD) is a syndrome of childhood misbehavior that wanes throughout puberty and adolescence has been challenged by volumes of research and a continual refinement of standardized diagnostic criteria.

Attempting to understand the burden of psychiatric illness across the life span is often complicated by the fact that, with the progression of time and parallel developmental maturation, the core features of a disorder may present differently. Thus the study and treatment of childhood psychopathology often require an interpretation of symptom expression that takes into account normal development. Examining ADHD across the life span presents unique challenges because the diagnostic criteria require that the disorder be evident by 7 years of age. Natural development leads to many behavioral changes throughout childhood, adolescence, and adulthood, requiring that clinically relevant research have a nuanced interpretation of symptom expression of ADHD in older subjects.

This chapter describes the history of the disorder and the current longitudinal studies of ADHD children into adulthood, with a special focus on the changing operational definition of the disorder, the reliance on the presence of hyperactivity in diagnosis, the impact of normal developmental maturation on recognizing problem behaviors at different ages, and the clinical significance of the diagnosis in older or adult subjects.

Definition and diagnostic criteria

ADHD has long been considered a behavioral disorder of childhood even if under different names. In the 1930s, hyperkinesis, impulsivity, learning disability, and short attention span were described as minimal brain damage and later as minimal brain dysfunction because these symptoms mimicked those seen in patients with frank central nervous system (CNS) injuries. In the 1950s, this label was modified to hyperactive child syndrome, with the eventual inclusion of hyperkinetic reaction of childhood in *DSM-II* in 1968 (American Psychiatric Association, 1968). Each of these labels and sets of criterion was focused exclusively on children and placed the most importance on hyperactivity and impulsivity as hallmarks of the disorder. Although the section of *DSM-II* dedicated to hyperkinetic reaction of childhood was very brief and unstructured, it remained the prevailing standard until publication of *DSM-III* in 1980 (American Psychiatric Association, 1980).

DSM-III represented a significant change in the description of the disorder and was the first to formally recognize inattention as a significant component of the disorder. Its definition also recognized developmental variability and indicated that this variability may play a role in the presentation of the disorder in individuals of different ages. Most importantly for this discussion, *DSM-III* included a residual type of ADHD that could be diagnosed in individuals with a history of meeting full criteria for the disorder, but who presented with a reduced set of symptoms, if the remaining symptoms continued to cause significant levels of impairment. Although the revision of *DSM-III* published in 1987 (American Psychiatric Association, 1987) eliminated the residual type of ADHD, this type returned in 1994 with the publication of *DSM-IV* (American Psychiatric Association, 1994), which also offered

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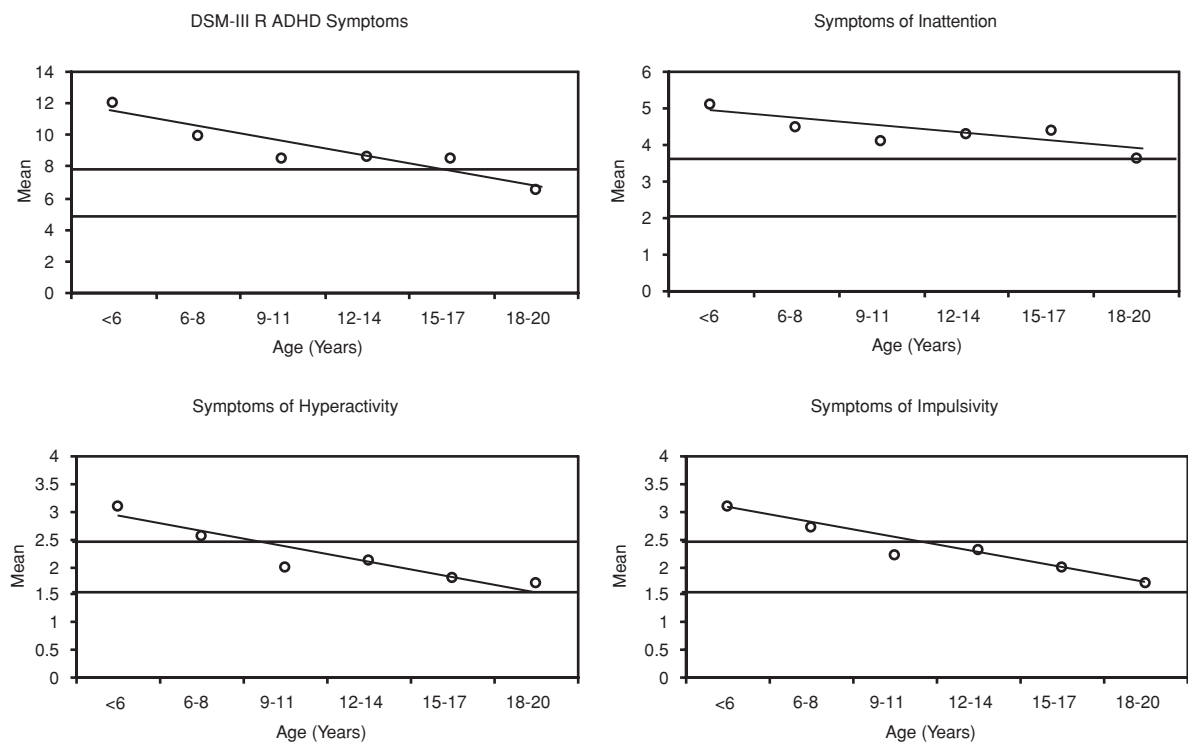Section 1: The development of adult ADHD as an epidemiological concept

Figure 1.1 Age-dependent decline of ADHD symptoms.

criteria for specific subtypes of ADHD marked by inattention, hyperactivity/impulsivity, or both core features of the disorder.

As the field has struggled with how to characterize ADHD for the past several decades, there has been a consistent underlying notion that ADHD is not a completely remitting condition in all cases. The emphasis on hyperactivity in earlier years has also been shown to affect the rates of persistence of the disorder in prospective follow-up studies with the longest duration.

Age-dependent symptom decline

Much of the difficulty in making the diagnosis of ADHD in children arises from the fact that many of its symptoms are similar to developmentally appropriate behavior in young children. It is natural for a 4-year-old child to exhibit hyperactivity and impulsivity, for example. The diagnosis of ADHD in very young children then relies on the extent to which reported symptoms are more pronounced or prevalent than in other children of the same age. This may affect estimates of duration and definitions of chronic ADHD because as children normally outgrow much of the hyperactivity

and impulsivity, the degree to which these symptoms continue to be of primary concern in making the diagnosis may also decline.

My colleagues and I specifically addressed the relative rate of decline of the core symptoms of ADHD from childhood into early adulthood to offer a developmental perspective on symptom decline (Biederman et al., 2000). ADHD subjects who returned for 4-year follow-up study were examined at multiple time points to estimate the prevalence of different symptomatic categories in different age groups. For each of the ADHD subjects (N = 128), we had five time points of symptom observations: (1) symptoms that had occurred at the disorder's onset as reported retrospectively during the baseline assessment; (2) symptoms that were currently active at baseline; (3) symptoms that were currently active at the Year One follow-up assessment; (4) symptoms that were active at the beginning of the interval covered by the 4-year follow-up based on subject recall; and (5) symptoms that were currently active at the Year Four follow-up assessment.

The mean number of ADHD symptoms in our sample of ADHD children and adolescents was
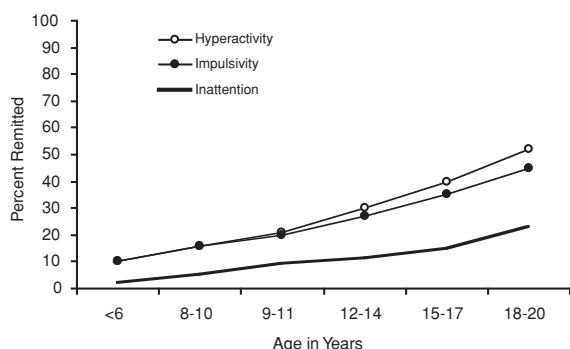
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Figure 1.2 Prevalence of symptomatic remission with increasing age.

modeled as a function of age. In Figure 1.1 the predicted regression lines are plotted and horizontal lines are darkened at the value corresponding to full or subthreshold diagnoses. Age was significantly associated with symptom decline for total ADHD symptoms, as well as for each of the symptom subtypes (all Wald $\chi_{(1)}^2 > 22.9$, all p values <0.001). However, the mean number of symptoms did not fall below the subthreshold level for any of the symptom summations of any age group studied. On average, symptoms of inattention did not fall below the full threshold level by 20 years of age, whereas symptoms of hyperactivity and impulsivity did fall below the full threshold level between 9 and 11 years of age.

However, group averages do not indicate the actual prevalence of remission in each age group. Figure 1.2 presents the prevalence of symptomatic remission (having less than half of the symptoms required for the full diagnosis) for all ADHD symptoms and for each of the subtypes. We found a different rate of symptomatic decline for inattention and hyperactivity/impulsivity. Whereas symptoms of inattention declined at a very modest rate, those of hyperactivity and impulsivity remitted much more abruptly. This work demonstrated that, even in a sample of ADHD children with a high rate of symptom persistence (Biederman et al., 1996), overt symptoms of hyperactivity and impulsivity tend to decline with increasing age. Hart et al. (1995) documented a similar pattern of ADHD-subtype specific persistence: the mean number of hyperactive/impulsive symptoms declined with age, whereas the mean number of inattentive symptoms remained stable from age 8 to 15 years. Thus, it seems that the persistence of ADHD is contingent on continued inattention more than on overt hyperactivity or impulsivity.

Impact of symptom decline patterns on rates of persistence

A relatively large number of studies have been published that estimate the persistence of ADHD throughout adolescence and adulthood. Table 1.1 presents the pertinent results from each these studies. Clearly, the rate of ADHD at follow-up varies considerably from one study to the next. For example, Mannuzza et al. (1998) reported that at follow-up 4% of previously hyperactive boys continued to have ADHD, whereas Hart et al. (1995) found that 85% of ADHD cases met criteria for ADHD at follow-up. However, these divergent findings should not be surprising considering the significant heterogeneity between these studies in diagnostic criteria employed, duration of follow-up, and age of the sample at follow-up.

Table 1.1 also indicates that the changing diagnostic classification of ADHD over the years has influenced estimates of persistence of the disorder. The studies listed in Table 1.1 are categorized by the diagnostic system that was used to ascertain the samples. Samples in studies initiated under *DSM-II* had the lowest rate of persistence, whereas the rate of persistence in samples identified under *DSM-III-R* was the highest. This finding is consistent with our earlier work showing the increased rate of remission from hyperactive and impulsive symptoms relative to symptoms of inattention.

Perhaps one of the most important variables is age at follow-up – certainly a 5-year follow-up of 12-year-olds will result in a higher prevalence of ADHD than a 5-year follow-up of 25-year-olds. Hill and Schoener (1996) used this level of heterogeneity in age to estimate the expected rate of ADHD in older populations. They conducted a secondary data analysis of a subset of the studies presented in Table 1.1, selecting those in which the original diagnoses were made concurrently with the creation of the studies' baseline in childhood and in which the follow-up reported the persistence of standardized assessments of ADHD. Hill and Schoener fit a model to these data that predicted an exponential decline in the rate of ADHD and estimated the rate of adult ADHD to range from about 0.8% at age 20 to 0.05% at age 40. At first glance, these results seem to provide strong support for the idea that ADHD is essentially a remitting disorder.

Alternatively, the explanation for these discrepant findings may be that the use of different methods to determine diagnostic status at follow-up led to

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Table 1.1 Published studies estimating the persistence of ADHD throughout adolescence and adulthood

	Age range or mean at baseline (years)	Age at follow-up (years)	ADHD persistence		Follow-up ADHD diagnosis
DSM-II diagnosis at baseline					
Mendelson et al. (1971)	9.9	13.4	42	50	DSM-II
Borland & Heckman (1976)	7.5	30.4	10	50*	DSM-II
Mannuzza & Gittelman (1984)	7.9	17.4	12	33	DSM-III
Mannuzza (1984)	7.9	17.4	13	36*	DSM-III
Gittelman & Mannuzza (1985)	9.3	18.3	31	31	DSM-III
Gittelman (1985)	9.3	18.3	40	40*	DSM-III
Mannuzza et al. (1991)	7.3	18.5	21	22	DSM-III
Mannuzza et al. (1991)	7.3	18.5	41	43*	DSM-III
Mannuzza et al. (1993)	9.3	25.5	7	8	DSM-III, III-R
Mannuzza et al. (1993)	9.3	25.5	10	11*	DSM-III, III-R
Mannuzza et al. (1998)	7.3	24.1	3	4	DSM- III-R
Mannuzza et al. (1998)	7.3	24.1	3	4*	DSM- III-R
Lambert et al. (1987)	7.7	14.3	25	43	DSM-III
Lambert (1988)	9.3	18.3	47	80*	DSM-III
Feldman et al. (1979).	10.0	15.5	35	43	DSM-II
August et al. (1983)	10.7	14.2	19	86*	DSM-III
Weiss et al. (1985)	6–12	25.1	42	66*	DSM-III
Yan (1996)	10.0	25.5	140	70*	DSM- III-R
Combined estimate			39 ± 21%		
DSM-III diagnosis at baseline					
Cantwell & Baker (1989)	5.5	9.7	28	80	DSM-III
Offord et al. (1992)	4–12	8–16	16	34	DSM-III
Claude & Firestone (1995)	7.3	19.7	26	50	DSM- III-R
Rasmussen & Gillberg (2000)	7	22	28	56*	DSM-IV
Rasmussen & Gillberg (2000)	7	22	24	48	DSM-IV
Combined estimate			53 ± 41%		
DSM-III-R diagnosis at baseline					
Barkley et al. (1990)	4–12	14.9	88	72	DSM- III-R
Barkley et al. (1990)	4–12	14.9	102	83*	DSM- III-R
Barkley et al. (2002)	4–12	21.1	78	58	DSM-IV
Barkley et al. (2002)	4–12	21.1	89	66*	DSM-IV
Har et al. (1995)	9.4	10.4	89	84	DSM-III-R
Hart et al. (1995)	9.4	11.4	90	85	DSM-III-R
Hart et al. (1995)	9.4	12.4	92	77	DSM-III-R
Biederman et al. (1996)	10.5	14.5	109	85*	DSM-III-R
Biederman et al. (1996)	10.5	14.5	78	61	DSM-III-R
Biederman (2006)	10.5	22.8	63	58*	DSM-IV
Biederman (2006)	11.2	16.4	101	82*	DSM-IV
Combined estimate			73 ± 27%%		
*Residual ADHD diagnosis.					

different results. Because the number of symptoms present determines diagnostic status, different ways of interpreting symptom decline could lead to drastically different results. Focusing only on those subjects who continue to meet full diagnostic criteria may inflate the rate of remission by requiring a threshold that is too high because one still expects older subjects to present with significant rates of hyperactivity or impulsivity.

In our previous analysis of symptom decline (Biederman et al., 2000), we also assessed three levels of remission: syndromatic, symptomatic, and functional. *Syndromatic* remission refers to the loss of full diagnostic status, *symptomatic* remission refers to the loss of partial diagnostic status, and functional remission refers to the loss of partial diagnostic status plus functional recovery (full recovery). In our data, the rate of remission from the full disorder (syndromatic remission) was quite high, with 60% of our subjects aged 18 to 20 years old no longer meeting criteria for ADHD (Biederman et al., 2000). However, nearly one-third of subjects were still experiencing some ADHD symptoms (a symptomatic remission rate of 30%), and the majority of ADHD subjects continued to report low levels of functioning despite remission of the full diagnostic criteria (a functional remission rate of only 10%).

Therefore, Hill and Schoener (1996) may have been far too optimistic in declaring that the prevalence of ADHD in adult samples was nearly nonexistent. An expanded analysis of the literature supports the notion that in many studies subjects fail to reach symptomatic remission. Faraone et al. (2006) revisited Hill and Schoener's analyses by including studies that reported the follow-up rate of ADHD-residual type (analogous to symptomatic persistence). It should not be surprising that the inclusion of the less stringent definition of persistence resulted in higher rates in older subjects (see Fig. 1.3). Their meta-analysis found that, of children diagnosed with ADHD during childhood, 62% will continue to be symptomatic although only 19% would continue to meet full diagnostic criteria at age 25.

Although high rates of syndromatic remission indicate that individuals with ADHD frequently lose full diagnostic status, these figures may be misleading because they cannot distinguish individuals who fall just below the diagnostic threshold from those with very few active symptoms of the disorder. It is technically correct that those diagnosed with
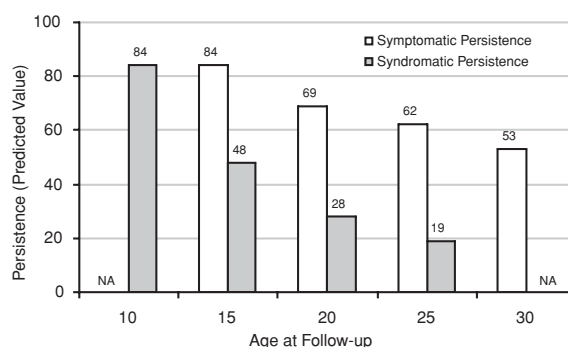

Figure 1.3 Predicted rate of persistence in follow-up studies of ADHD children.

ADHD in childhood who reach adulthood with one less symptom of the disorder may no longer satisfy criteria for ADHD, but it is clinically dubious to equate the absence of full syndromatic status with full recovery.

Thus, as expected from the work of Fischer (1997) and Biederman et al. (2000), the apparent prognosis of ADHD depends on what definition of persistence one uses. Our work examining differential rates of decline of ADHD symptom cores indicates that the choice of definition should be influenced by an individual's age and developmental expectations regarding hyperactivity, impulsivity, and inattention.

Clinical significance of ADHD in adults

If adult ADHD is a clinically significant disorder, then adults with ADHD should show functional impairments in multiple domains. Several studies suggest this to be the case. In an early study, Borland and Heckman (1976) compared ADHD adults with their non-ADHD siblings. The ADHD adults had lower socioeconomic status, more work difficulties, and more frequent job changes. Morrison (1980a, 1980b) compared ADHD adults with psychiatric controls matched for age and sex. The ADHD adults had fewer years of education and lower rates of professional employment. Similarly, others have shown that, among patients with substance use disorders, ADHD predicts social maladjustment, immaturity, fewer social assets, lower occupational achievement, and high rates of separation and divorce (Alterman et al., 1982; Eyre et al., 1982; De Obaldia & Parsons, 1984; Tarter, 1982; Wilens et al., 1998).

Murphy and Barkley (1996) compared 172 ADHD adults with 30 non-ADHD adults. The ADHD adults

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reported more psychological maladjustment, more speeding violations, and more frequent changes in employment. Compared with the non-ADHD adults, more ADHD adults had had their drivers license suspended, had performed poorly at work, and had quit or been fired from their job. Moreover, the ADHD adults were more likely to have had multiple marriages.

Barkley et al. (1996) evaluated the motor vehicle driving knowledge and skills and negative driving outcomes of older teens and young adults with ADHD. Although the young adults with ADHD showed no deficits in driving knowledge, they had elevated rates of speeding citations, suspended licenses, crashes, and accidents causing bodily injury compared to those without ADHD. They were more likely to be rated by themselves and others as having poorer driving habits. In addition, on a computer-simulated driving test, young adults with ADHD had more crashes, scrapes, and erratic steering.

Given that academic underachievement is a well-known correlate of ADHD in childhood (Hinshaw, 1992), ADHD adults ought to have histories reflecting school problems. Several studies have shown this to be so. Our work demonstrated that, compared with control adults, ADHD adults had significantly higher rates of repeated grades, tutoring, placement in special classes, and reading disability. Similarly, Murphy and Barkley (1996) showed that adults with ADHD had histories marked by poorer educational performance and more frequent school disciplinary actions against them. Notably, in addition to showing an increased likelihood of having a history of school failure, Seidman et al. (1998) demonstrated that this history could not be accounted for by age, learning disabilities, psychiatric comorbidity, or gender.

We recently conducted a survey of 1000 ADHD and non-ADHD adults in the United States (Biederman et al., 2006). This survey, which had the largest sample of community-diagnosed adults with ADHD ever studied, showed that adults with self-reported ADHD in the community suffer from significant impairments across multiple domains of functioning. We found adult ADHD to be associated with histories of school failure, occupational impairment, substance use, traffic violations, arrests, decreased quality of life, and sexual problems. Taken together, these findings support the idea that, even in those adults diagnosed in the community, ADHD is a clinically significant and highly disabling disorder (Biederman et al., 2006).

Impact of treatment on course

Although there is a wealth of research on the efficacy of pharmacotherapy in treating symptoms of ADHD (Spencer et al., 1996, 2002), we do not know if treatment during childhood has an impact on the symptomatic or functional remission from the disorder as described here. In fact we are unable to assess the impact of treatment in the short or long term in naturalistic studies because exposure to therapy is not randomly assigned (Faraone et al., 1992). Observational research of treatment efficacy is often misleading because of confounding by indication: a situation in which severely ill patients are more likely to receive treatment so that aggressive therapy appears to be inversely associated with improvement solely due to the inability to control the allocation of treatment.

For example, subjects likely to be among remitters may be likely to receive therapy for a shorter duration because their symptoms have remitted, whereas those with persistent symptoms are more likely to have been exposed to a longer period of treatment. Under this reasonable assumption, naturalistic studies would clearly show that treatment is inversely associated with rates of remission. Research is needed that examines both the motivation for continued treatment in naturalistic follow-up studies and the impact of therapy in subjects treated in a randomized clinical trial over the long term.

Summary

At any age, ADHD may be considered a chronic disorder because its symptoms may persist for a long period of time and over a wide range of settings. The use of more developmentally appropriate measures of ADHD in adolescents and adults reveals that a sizable proportion of children with the disorder will continue to exhibit impairing symptoms of the disorder into adulthood. The impact of ADHD on society is enormous in terms of financial cost, stress to families, impact on academic and vocational activities, as well as negative effects on self-esteem. Because the disorder is not episodic but frequently chronic, ADHD may be a relatively common psychiatric disorder of adulthood in reference to other disorders.

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Chapter 2

The prevalence and correlates of adult ADHD

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It has long been known that attention-deficit/hyperactivity disorder (ADHD) is one of the most common psychiatric disorders among children (Bird et al., 1988; Shekim et al., 1985). However, there is much less agreement about the extent to which ADHD persists into adulthood. Indeed, some authors state that adult ADHD is very rare (Shaffer, 1994), whereas others report that it is quite common (Barkley, 1997). The claim that adult ADHD is rare can be traced to theoretical discussions about the role of maturation in resolving childhood impulsivity (Cantwell, 1985). The empirical study that is consistently cited to support this claim is the influential meta-analysis carried out by Hill and Schoener (1996) of nine prospective studies of children who were diagnosed with ADHD and then followed between 4 and 16 years. The aim of the meta-analysis was to develop a mathematical model of the extent to which ADHD prevalence decreases with age. The nonlinear model developed by Hill and Schoener to fit the data in these nine studies estimated that ADHD prevalence decreases by approximately 50% every 5 years. Based on the assumption that ADHD prevalence is 4% in childhood, this model predicted that prevalence at age 40 would only be a fraction of 1%.

Subsequent critiques have argued that several methodological factors (e.g. small number of studies, nonrepresentative studies, inappropriate statistical model, sample attrition, reporting bias) introduced imprecision and potential bias into the Hill and Schoener estimates of ADHD persistence (Mannuzza, Klein, & Moulton, 2003; Sawilowsky & Musial, 1988). Leaving aside issues of change in diagnostic criteria and sample selection bias, which are endemic to adult follow-up studies of children diagnosed with ADHD in the past, the key issue in these critiques is whether to require adults to meet full diagnostic criteria or to have only some symptoms to be counted as cases. In their meta-analysis Hill and Schoener required adults to meet full diagnostic criteria, resulting in adults who had ADHD as children being classified as "remitted" even if they continued to have seriously impairing symptoms. An indication of how critical this distinction is can be seen in a subsequent short-term follow-up study of an ADHD patient sample, which found that, although only 38% of cases continued to meet full criteria for ADHD at age 19, 90% continued to have clinically significant impairment associated with remaining symptoms (Biederman, Mick, & Faraone, 2000).

Uncertainty about diagnostic criteria

It is important to note in this regard that diagnostic criteria for ADHD have never been developed specifically for adults, making it unclear what it means to meet "full criteria" for adult ADHD. In *DSM-III*, the category of residual attention-deficit disorder was defined to include adults who met full criteria for the disorder as children and have a partial syndrome as adults, but this category was removed from *DSM-III-R*. Meanwhile, a number of clinical research groups have proposed that the distribution of the three cardinal symptom clusters found among children – inattention, hyperactivity, and impulsivity – shifts in adulthood so that inattention becomes the most prominent symptom cluster, and other symptoms, such as affective lability, explosive temper, inability to tolerate stress, and dysphoria, emerge as more prominent than in childhood (Riccio et al., 2005; Wender et al., 1985). Based on this change in symptom presentation, experts agree that more research is needed to develop valid diagnostic criteria for adult ADHD (Adler & Cohen, 2004; McGough & Barkley, 2004; Wender, Wolf, & Wasserstein, 2001).

Section 1: The development of adult ADHD as an epidemiological concept

In light of this uncertainty about diagnostic criteria, a legitimate question can be raised whether adult ADHD is a genuine disorder. The data are quite compelling that it is. This conclusion is based both on (1) clinical evidence that diagnosis, albeit fettered with the conceptual problems described in the last paragraph, is of considerable value in predicting symptom persistence and progression, severity, and treatment response, and on (2) evidence of genetic transmission and abnormalities in brain structure and function (Resnick, 2005; Seidman, Valera, & Makris, 2005; Wilens, Faraone, & Biederman, 2004).

Indirect assessments of prevalence

Given that ADHD is a genuine adult disorder, how common is ADHD in adulthood? The answer is clouded by the uncertainty associated with diagnostic issues. Because of this uncertainty, none of the many adult community psychiatric epidemiological surveys carried out over the past two decades with either the Diagnostic Interview Schedule (Robins et al., 1981) or the Composite International Diagnostic Interview (CIDI; Robins et al., 1988) included an assessment of adult ADHD. As a result, little is known about the general population epidemiology of adult manifestations of this disorder. Attempts to estimate prevalence by extrapolation from childhood prevalence estimates in conjunction with adult persistence estimates (Barkley et al., 2002; Biederman et al., 2000; Mannuzza et al., 1988; Weiss et al., 1985) or by direct estimation from small sample of adults (Murphy & Barkley, 1996) or of college students (Heiligenstein et al., 1998) have yielded prevalence estimates ranging from 1–6%. However, these estimates are all based on convenience samples.

One way to obtain a more accurate prevalence estimate would be to build on a more firm set of estimates from previous studies that linked information about prevalence in childhood with information about persistence into adulthood. Faraone and his colleagues recently reported the results of a comprehensive meta-analysis of all published follow-up studies of ADHD; it provides the best currently available estimate of persistence into adulthood (Faraone, Biederman, & Mick, 2006). This study, which was carried out along the same lines as the Hill and Schoener meta-analysis (1996), deviated from the earlier approach in distinguishing between syndromal and subsyndromal persistence of adult ADHD. The analysis showed that,

whereas only a relatively small proportion of cases (approximately 15%) in the studies examined continued to meet full criteria for ADHD in adulthood, a majority (approximately two-thirds) continued to have enough symptoms and impairment to qualify for a *DSM-IV* diagnosis of ADHD in partial remission.

The population prevalence of broadly defined ADHD at age 25, then, might be expected to be roughly two-thirds as high as the prevalence in childhood, although caution is needed in making this extrapolation based on the fact that the follow-up studies examined by Faraone et al. (2006) included clinical samples in which the most serious childhood cases are presumably overrepresented. This factor is important because severity of childhood symptoms strongly predicts adult ADHD persistence (Kessler, Adler, Barkley, et al., 2005). A further complication in using this indirect way to estimate the prevalence of adult ADHD is that prevalence estimates of childhood ADHD have an extremely wide range – from as low at 1.5% to as high as 19.8% (Cuffe et al., 2001; Cuffe, Moore, & McKeown, 2005; Faraone et al., 2003; Pastor & Reuben, 2005). If we take the median of the range, which is 7–9%, we would predict that the prevalence of adult ADHD would be roughly 5–6%, but this could be an overestimate for the reason described in the first part of this paragraph.

Screening assessments of prevalence

Two recent reports described the results of general population surveys that attempted to screen for adult ADHD (Faraone & Biederman, 2005; Kooij et al., 2005). Faraone and Biederman (2005) carried out a telephone survey with 966 adults in the United States that used semi-structured research clinical interviews to assess adult ADHD using *DSM-IV* criteria. The authors estimated that 2.9% of respondents met full *DSM-IV* criteria for ADHD and that 16.4% met subthreshold criteria. Kooij et al. (2005) carried out a self-report survey of a representative sample of 1813 adults selected from an automated general practitioner registry in the Netherlands. They used a fully structured questionnaire to estimate the prevalence of adult ADHD. No clinical follow-up interviews were carried out to validate these self-reports. The authors estimated the prevalence of adult ADHD to be 1.0% when full *DSM-IV* criteria were required and 2.5% when the diagnosis was relaxed to require four rather than six current symptoms.