

Critique of the article by Visser and Jehan (2009): ‘ADHD: a scientific fact or a factual opinion? A critique of the veracity of Attention Deficit Hyperactivity Disorder’

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This article seeks to evaluate and take further the discussion put forward by Visser and Jehan (*Emotional and Behavioural Difficulties* 14, no. 2: 127–40). It begins by focusing on the biomedical discourse, its dominance in the academic and professional literature and why the existence of Attention Deficit Hyperactivity Disorder (ADHD) as a medical category is questionable. This is followed by a discussion of other discourses including the sociological discourse and the bio-psychosocial discourse. The importance of multi-professional approaches in the identification, assessment and management of ADHD is highlighted, followed by an examination of what part the educational environment might play with regard to behaviours associated with ADHD. Attention is drawn to the need for continuing research and debate on this evolving concept.

Keywords: ADHD; biomedical discourse; bio-psychosocial discourse; educational environment; multi-professional approach; sociological discourse

Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is one of the most widely studied childhood disorders, which has attracted discourse and debate from professionals in many disciplines, including education, psychology, sociology and medicine. Internet searches provide evidence of a growing number of international references to ADHD and an increasing interest in issues surrounding the disorder. A search for ‘ADHD’ on 4 December 2004 using the popular Google search engine produced 55,900 UK results and 1,170,000 worldwide results. On 11 April 2010, these figures had risen to 768,000 in the UK and 13,900,000 worldwide. There are obvious limitations as to the validity of some of these results and sources. In addition, there are questionable claims of exponential growth in the numbers of children said to have ADHD. International estimates of prevalence rates vary widely but it has been suggested that in England and Wales between 1–5% of school-aged children would meet the diagnostic criteria for some type of ADHD (NICE 2006).

The article by Visser and Jehan is a valuable and timely contribution to the continuing debate surrounding ADHD. With ever-rising numbers of pupils being diagnosed with the disorder and prescribed medication, it is right to continue asking questions about the many controversial aspects of the disorder, including aetiology and interventions and particularly about the truth or reality of ADHD as a biological category. This article will seek to evaluate the views put forward by Visser and Jehan and to offer a further contribution to the discussion

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of the questions they pose; in particular, why the existence of ADHD as a medical category is questionable. A discussion of the bio-psychosocial discourse highlights the importance of multi-professional approaches in the identification, assessment and management of ADHD. There follows an examination of what part the educational environment might play with regard to behaviours associated with ADHD. The need for continuing research and debate on features of this evolving concept is highlighted.

Biomedical discourse

As the article by Visser and Jehan provides a comprehensive account of the perceived medical aetiology of and biomedical interventions for ADHD, this article will offer only a brief summary of the biomedical discourse. The biomedical perspective supports the view that ADHD is primarily caused by neurological dysfunction and that deficits in behavioural inhibition and attention are central to the disorder. By using scientific methods including neuroimaging techniques, these deficits have been linked with particularly low levels of activity in the neurotransmitters in the frontal lobes of the brain, which control impulses and regulate the direction of attention. The causes of this particular brain dysfunction are believed to be genetic in 70–95% of cases (Barkley et al. 2002).

‘Alongside the evidence that correlates the origins of ADHD to an innate biomedical dysfunction, pharmacogenomic research has also claimed to have established justifications for the use of pharmacological interventions to treat ADHD’ (Visser and Jehan 2009, 130). It is claimed that psycho-stimulants such as methylphenidate and amphetamine increase the arousal of the central nervous system. There are reports of improvements in classroom behaviour, attention and concentration in children with ADHD, although there have been conflicting results of the effects on academic achievement (Doherty et al. 2000). Positive effects on peer and family relationships have also been observed. In 151 out of 256 schools who responded in a recent school survey in a local authority in England there were 413 pupils reported as being formally diagnosed with ADHD. This represents 0.53% of the total local school population; that is, 5.3 pupils per 1000. Seventy-seven percent of those pupils were known to be taking medication. Positive behaviour changes with medication were reported by teaching staff in 70% of cases. Examples of these included: ‘calmer’, ‘more focused’, ‘improved concentration’, ‘less aggressive’ and ‘less fidgety’ (Wheeler 2007).

The dominance of biomedical discourse

The biomedical discourse is indeed prominent in the academic and professional literature. This, as Visser and Jehan state, may be due in part to the fact that ‘research into ADHD has been centred largely on an integration of subjective clinical knowledge with scientific investigation . . . (and that) this discourse . . . is conveyed to the public by the powerful people who are perceived to have the specialist knowledge within this discipline, such as doctors, psychiatrists and pharmaceutical companies’ (2009, 134).

One way to try to understand the reason for the dominance of the biomedical perspective is to examine the differences and rivalry between the professions involved in the assessment and management of ADHD as well as the amount of power these professions may exert. The medical profession has historically been dominant in the hierarchy of professions. It is possibly held in higher regard than other professions such as teaching and social work, which have only more recently required degree-level training in the UK. Medical practitioners and clinicians receive training relevant to the needs of their profession. They work

within health legislation and are required to take account of National Health Service (NHS) guidelines, including those published by the National Institute for Health and Clinical Excellence (NICE). Education professionals on the other hand have traditionally been trained to educate and are subject to legislation and guidance from the relevant government departments, including those focusing on provision and support for pupils with special educational needs (SEN).

Several years ago a project undertaken by Maras and Redmayne found that some teachers viewed ADHD as a medical phenomenon and dissociated themselves ‘personally and thus professionally from the label ADHD’ (1997, 43). Hjärne and Säljö (2004) found that school professionals in Sweden viewed the diagnosis of ADHD and medicalisation as an end in itself. Recent educational developments in the UK such as the inclusion agenda and *Every Child Matters* have led to changes in attitudes and more focus on the need to provide appropriate support in mainstream schools for pupils with SEN, including those who experience behavioural difficulties and disorders such as ADHD (DfES 2001, 2003, 2004; DCSF 2007).

Why is the existence of ADHD as a medical category questionable?

Visser and Jehan ask: ‘if the biological discourse provides such an incontrovertible explanation, why is ADHD a contentious area and why is the existence of ADHD as a medical category questionable?’ (2009, 131). One could also ask why Barkley felt the need to take the unprecedented step of publishing the ‘International consensus statement on ADHD’, in which he and 74 prominent medical doctors and researchers confirmed the status of the scientific findings concerning the validity of the disorder (Barkley et al. 2002), immediately stimulating additional debate and leading to Timimi and 33 co-endorsers publishing a ‘Critique of the international consensus statement on ADHD’ (Timimi et al. 2004).

In attempting to answer the above-mentioned questions, the next section will begin with a brief examination of the use of diagnostic classifications and labels before focusing on the controversy concerning the use of medication.

Diagnostic classifications and labels

Although the biomedical paradigm suggests neurological dysfunction as the main cause of ADHD there is no definitive test which can establish conclusively the existence of the disorder in an individual. Currently ADHD is described as a mental disorder in the *Diagnostic and statistical manual of mental disorders* (DSM-IV) (American Psychiatric Association 2000), with the similar hyperkinetic disorder (HKD) being included in the *International classification of diseases* (ICD-10) (World Health Organisation 1990). Diagnosis is made using diagnostic criteria, the categories of which ‘are not based on any scientific data, but on panels of experts’ opinion’ (Diller 2006, 8). One of the main criticisms regarding diagnostic criteria checklists is that they rely on subjective judgments with regard to frequency of behaviours (British Psychological Society 1996). In 16 out of 18 DSM-IV criteria the word ‘often’ is used. The ICD-10 criteria for hyperkinetic disorder use words such as ‘unduly’, ‘excessive’, ‘markedly’ and ‘significant’. Another limitation of a categorical approach is the heterogeneity of symptoms displayed by individuals sharing a diagnosis.

Controversy over the use of ‘labels’ such as ADHD often focuses on the relationships between the professions involved in treating pupils who have the disorder. Educational legislation in the UK does not require categories of disability in order to provide for individuals with special educational needs, whereas the medical profession requires a specific

diagnosis or classification, particularly if it includes prescription. Labels can be used in negative or positive ways and some inclusive schools reject using labels just for the sake of them. Those from various professions who view labels such as ADHD as constructive emphasise their use in accessing the required resources and support for the pupil. The important factor is that labels should be used consistently across disciplines (Wheeler 2007). It also makes sense to follow the suggestion made by Visser and Jehan that ‘educational professionals would do well to look beyond the label to the child’s needs’ (2009, 127). Cains suggests consideration of a non-labelling approach which might ‘avoid a possible coalescence of factors into a “prototypical” ADHD child, with the risk of concomitant negative and self-fulfilling attitudes, when the label is applied’ (2000, 175).

There are many other disorders or labels used to identify children who experience various difficulties but not all attract as much debate as does the concept of ADHD. The main reason for this could be the use of stimulant medication as an intervention.

Controversy concerning the use of medication

The use of medication continues to be one of the most debated and controversial issues surrounding the concept of ADHD, particularly when it is prescribed as the first-line, sometimes only, course of treatment. One major concern regarding the use of medication centres on the question of ‘who benefits?’ ‘Economic benefits clearly accrue to professionals who decide to “diagnose and prescribe”: teachers, psychologists and school principals all benefit financially when “special needs” funding is reallocated around children who are educationally redefined as “ADHD”’ (Baldwin 2000, 456). Some parents may choose to seek a diagnosis of ADHD in an effort to prove that their child’s challenging behaviour is not their fault. It could be argued that improved behaviour brought about by the use of medication is of more benefit to parents and teachers than to the child (Purdie et al. 2002). However, as Graham states, ‘stimulant medication . . . operates *during school hours* . . . Parents have to deal with the rebound effects of that medication which, incidentally can cause behaviour far worse than that which the child was originally medicated for . . . The argument that parents medicate children for their own benefit is ludicrous’ (2008, 20). There is a need for further research to be undertaken into the perspectives of parents and of the pupils themselves regarding the use of medication.

By modifying children’s behaviour, it can be argued that medication is being used as a form of social control (Baldwin 2000) and there are concerns that medication is being prescribed to children who do not satisfy the diagnostic criteria for ADHD. Critics of the use of medication cite the various adverse effects that have been reported. The most common short-term side effects include appetite suppression, abdominal pain, headaches, sleep difficulties, rebound effect, tics, itchy skin, rashes, a feeling of depression, mood change or nausea (Cooper and Bilton 2002). ‘Side effects are relatively benign and are more likely to occur at higher dose levels’ (DuPaul and Stoner 2003, 222). Suggested long-term side effects are suppression of height and weight gain. Cooper and Bilton report that ‘growth retardation is not a significant risk factor, although in some cases children under 10 years of age show a transient decrease in weight and slight growth slowing, which later normalise’ (2002, 80). It is important that all medication effects, both positive and negative, are monitored closely.

There has been debate about the involvement of large pharmaceutical companies: (a) offering financial incentives to parent support groups; and (b) making huge profits through increasing numbers of prescriptions. It has been suggested that most of the authors of Barkley’s *Consensus statement* mentioned earlier have financial links with the pharmaceutical

industry (Timimi 2005). However, Coghill points out that ‘extended-release stimulant and non-stimulant treatments for ADHD . . . would not have been possible without considerable investment on the part of the pharmaceutical industry’ (2005, 288). Ongoing research has contributed to the development of different formulations of medication. In the US, methylphenidate skin patches have recently been licensed for the treatment of 6–12 year olds with ADHD. A patch is attached to the child’s hip and is effective for nine hours, although it may continue to be effective for another three hours after removal (Anderson and Scott 2006). This type of treatment could be beneficial in cases where a child or young person has difficulty in swallowing tablets, does not respond to other treatments or experiences more severe side effects.

The cost to health and other public services is another factor involved in the widespread use of medication to treat ADHD. ‘One study estimated the excess cost of the condition (relating to education, occupation impairment and medical treatment) to be \$31.6 billion in the USA in 2000’ (Chamberlain and Sahakian 2006, 35). Similar figures are not readily available in the UK. In 1998 there were approximately 220,000 prescriptions for stimulant medications in England, rising to 418,300 prescriptions in 2004, with modified-release formulations of methylphenidate accounting for 54% of all prescriptions. Recent figures suggest that about 32,000 children are currently being treated with drugs at a cost of £13.5 million a year (NICE 2006).

There is some evidence of misuse of ADHD medication, in particular Ritalin:

- *As a recreational drug.* Some teenagers use it to achieve an amphetamine-like rush, similar to the ‘high’ experienced when using cocaine.
- *As a study aid.* It has been alleged that some parents are buying Ritalin to boost their children’s performance during exam times. It enables youngsters to work late and focus the mind.

In 2004 in the US it was reported that about 2.5% of 13–14 year olds and 5.1% of 17–18 year olds have taken the drug illegally for one of the above purposes. There is anecdotal evidence in the UK of students selling their prescription medication or being targeted by bullies who steal it (Brettingham 2007). In an earlier research study in the US, Moline and Frankenberger (2001) found that out of 50 students receiving medication who completed anonymous self-report questionnaires, 34% reported being approached to trade or sell their medication.

A further area for debate is that it is still not known exactly how medication works in the treatment of ADHD, although it is suggested that psycho-stimulant medication such as methylphenidate and dexamphetamine affects the balance of noradrenaline and dopamine in the brain. Research has found that it improves concentration in all individuals, including those who are not diagnosed with ADHD (Purdie et al. 2002). Atomoxetine, a non-stimulant medication, was licensed for use in the US in 2002 and in the UK in 2004 to treat children aged six years and over, adolescents and adults. It is described as ‘a selective noradrenaline reuptake inhibitor, although the precise mechanism by which it works on ADHD is unknown’ (NICE 2006, 8). There is a lack of evidence for long-term efficacy and safety of medication. Very few studies have been carried out and most have been of low quality or short duration. Inconsistencies in findings ‘may be attributable to failure to control for the type and severity of the ADHD, and/or for type and dosage of medication, and/or for the existence of other associated or co-morbid conditions, and/or the type and quality of the accompanying educational interventions, if any’ (Alban-Metcalf and Alban-Metcalf 2001, 89).

Following an examination of the biomedical discourse and discussion of ‘the lack of true certainty in the biomedical aetiology and treatment of ADHD’ (Visser and Jehan 2009, 136), the discussion now focuses on other more marginalised discourses.

Sociological discourse

The sociological discourse contends that ‘ADHD does not exist as a true objective disorder’ (Visser and Jehan 2009, 128). Within the discourse there are varying perspectives from which the concept of ADHD may be viewed, for example as a socio-cultural construct or a psychosocial disorder.

There have been many references in the literature that suggest that ADHD is not a modern phenomenon and that the various name changes that the disorder has undergone throughout the twentieth century reflect changing conceptualisations of the nature of the condition (Wheeler 2007). As early as 1846, Heinrich Hoffman, a German physician, included an illustrated story entitled ‘Fidgety Philip’ in a children’s book *Struwwelpeter*, in which typical symptoms associated with ADHD were described in detail. One of the first professional reports of the disorder was probably in 1902 in *The Lancet* by George Still, a British paediatrician. However, Graham challenges suggestions that the disorder has existed for over 100 years and questions how ‘the activity levels of children in contemporary times can be directly compared to and correlated with those of children who happened to come under adult scrutiny in the repressive Victorian era’ (2008, 19).

Historically, characteristics which would have been valued in a ‘hunter-gatherer’ society would have included being hyper-vigilant, hyperactive or ‘response-ready’: all behaviours associated today with ADHD (Munden and Arcelus 1999). Offering what he describes as a cultural-political perspective, Timimi suggests that ‘ADHD can be seen as one of the most recent cultural defence mechanisms that has been invented as a cultural way of trying to deal with the growing anxieties about childhood development that are present in modern, Western culture’ (2005, 130). Changes in society and a weakening of traditional family structures contribute towards difficulties experienced by children. In today’s world more children have short attention spans and instant gratification offered in modern consumer culture means that children are not being taught to control their impulses. Fears about safety mean that children are more often in the home, lacking sufficient outdoor exercise which might in the past have used up some hyperactive energy (Timimi 2005).

Sociological perspectives do not generally accept that there is a biological element when seeking to explain the aetiology of the disorder and therefore most do not recommend the use of medication as an intervention. Instead, a multifactorial, multi-perspective approach is recommended, using ‘non-toxic solutions for ADHD-type behaviours’ (Timimi 2005, 146). Baldwin states that ‘there are at least 230 non-drug interventions for children and teenagers, including . . . counselling, behaviour therapy, family therapy, contingency management, applied behaviour analysis and behaviour modification’ (2000, 460–1).

Bio-psychosocial discourse

As the name implies, the bio-psychosocial perspective includes features of both biomedical and psychosocial discourses. ‘ADHD is widely argued to be the product of a complex interaction between biological and social-environment factors’ (Cooper 2008, 464). Biological factors include genetic influences and brain functions, psychological factors include cognitive and emotional processes and social factors include parental child-rearing practices and classroom management (British Psychological Society 2000).

A bio-psychosocial disorder requires a bio-psychosocial approach to interventions. When medication is used it should be as part of a multi-modal, multi-professional treatment approach. The aim of medication is to control symptoms so that the child is more receptive to other forms of non-medical interventions. Medication ‘can be seen to provide a “*window of opportunity*” for the child to benefit from teaching-learning experiences provided by teachers, parents and others’ (Alban-Metcalfe and Alban-Metcalfe 2001, 89). Medical intervention should not always be the first and only line of treatment and it is not necessary in all cases of ADHD. Some individuals, particularly those with milder symptoms, might benefit from non-pharmacological interventions which combine educational, psychological and social approaches.

The importance of multi-professional involvements

The bio-psychosocial discourse suggests that throughout the identification, assessment and management of ADHD there is a need for effective multi-professional working, particularly between health and educational professionals when medication is used as part of a multi-modal intervention. Although diagnosis of ADHD is made by a qualified medical clinician (a paediatrician or child psychiatrist), an accurate assessment requires evidence of pervasiveness and should be based on detailed information from parents, teachers, educational psychologists and other professionals (British Psychological Society 2000). Following diagnosis, teachers can play an important role in monitoring the positive and negative effects of medication and other interventions in the school setting. They are also in the best position to compare the child’s academic progress and behaviour with his or her peers (Cooper and Bilton 2002).

Professionals from different disciplines need to agree on a set of common assumptions in order to ensure effective multi-professional working. Guidelines have been drawn up for successful multi-disciplinary working in the management of ADHD (BPS 2000), although any collaboration may present difficulties in practice. As mentioned in the earlier section on the dominance of biomedical discourse, when professionals from different disciplines work together ‘in delivering services for a multifactorial condition like ADHD, they have competing professional, political and economic agendas’ (Hughes and Cooper 2007, 55). There have been calls for closer working between professions in order to meet the needs of children more effectively and it has been suggested that a ‘lead professional’ or single named professional is identified to ensure a coherent package of services in cases where children and young people are supported by more than one specialist agency (DfES 2003).

There are indications that there can be variability in multi-professional working in the identification and management of ADHD in different local authorities and also in schools within the same local authority. Only 23% of schools who responded to the aforementioned ADHD survey had been asked to complete a questionnaire or behaviour rating list prior to diagnosis being made by a clinician. Following diagnosis, only 8% of schools reported having been asked to fill in a questionnaire by a clinician to monitor medication effects. In the survey educational professionals were asked to provide information on the numbers of pupils with a clinical diagnosis of ADHD. The findings suggest that schools do not always have accurate information regarding diagnosis of the disorder, in some cases relying on parents to provide details. Multiple responses were recorded on some questionnaires to the question regarding diagnosis by different agencies, possibly pointing to a lack of knowledge on the part of school staff as to who makes the diagnosis (Wheeler 2007; Wheeler et al. 2008).

There is a need for raised awareness of pathways for referral and care as well as training in ADHD for all professionals involved in the identification and management of the

disorder. In the UK specialist staff in some local authorities and some health services may offer relevant training and information. Some training providers now offer postgraduate courses in Integrated Children's Services, which focus on the analysis and development of collaborative strategies and effective provision of children's services. The development of integrated or multi-agency services could help overcome operational difficulties in multi-professional working (Wheeler 2010). Most importantly, 'relevant professionals need to work together in effective treatment, as no one professional group "owns" the management of these children' (Kewley 1999, 91).

The educational environment

'ADHD is at heart an educational issue' (Hughes and Cooper 2007, 6). The discussion now focuses on the educational environment and on what part it might play with regard to behaviours associated with ADHD. Schools are under pressure to raise academic standards while at the same time taking forward the inclusion agenda. Innovations including a National Curriculum, examination league tables, parental choice and school inspections can be problematic in the provision of effective inclusive education for pupils, particularly those diagnosed with ADHD.

Using systematic observation schedules based on DSM-IV criteria for ADHD, a recent research study in which six in-depth case studies were carried out in primary schools over a two-year period found that even the non-ADHD comparison pupils displayed some ADHD behaviours in some settings (on average, pupils diagnosed with ADHD displayed 45% and non-ADHD pupils displayed 14% ADHD behaviours during observed lessons) (Wheeler 2007; Wheeler, Pumfrey, and Wakefield 2009). This could be interpreted as a reflection on the current delivery of the curriculum and could suggest that the educational environment partly causes or exacerbates these behaviours (Cooper 2005). Graham draws attention to the fact that most of the DSM-IV criteria for ADHD diagnosis refer to required school based behaviour, stating that 'the modern and increasingly unnatural demands of schooling have resulted in the rearticulation of normal childhood exuberance, curiosity and energy as "unnatural". . . (with the) lowering of school entry ages, increased emphasis on academic learning and seat work . . . crowding of the curriculum . . . (and) the shortening of children's recess and lunchtimes' (2008, 23–4). Many of these factors may contribute towards pupils displaying characteristics associated with ADHD.

Diller uses the analogy of pupils with ADHD-type behaviours as 'round pegs . . . (that) must fit one way or another into fairly rigid square educational holes. Rather than looking closely at the fit and changing the hole . . . we try to change the kid or lubricate the fit with a drug' (2006, 11–12). Instead of focusing on attempting to somehow change pupils so that they fit into existing classrooms and schools, it is important to ask how the educational environment can be modified in order to offer a more inclusive education experience for such pupils. There is a need for more school-based research to be undertaken into variability of ADHD behaviour across contextual and curricular settings leading to the identification of appropriate interventions and approaches. It is important that the positive aspects of ADHD characteristics are taken into account and built into the delivery and organisation of lessons. As Cooper suggests, use should be made of 'pedagogical strategies designed to exploit, rather than inhibit, some of the characteristics associated with ADHD' (2005, 130). Positive attributes may include: the ability to focus deeply on selected topics; divergent thinking; being highly imaginative, innovative and inquisitive; sensitivity; creativity; tremendous energy; a willingness to take risks; enthusiasm; curiosity; and a sense of humour.

Educational practitioners need to be aware of the underlying theories concerning the nature of ADHD. Up-to-date information, research and proactive intervention strategies should be made available to schools. More investment in training is required, both at the initial teacher training stage and as part of continuing professional development including INSET training, so that teachers are equipped with the skills and knowledge needed for curricular and pedagogical flexibility. Effective teaching and learning strategies for children with ADHD may be beneficial for all pupils (Hughes and Cooper 2007). More effective approaches and interventions in school might mean fewer pupils needing medication (Wheeler 2010).

In the ADHD school survey which was referred to previously and undertaken in 2003, staff in only 31 schools (12%) reported having received any relevant training, although the majority requested further training and support (Wheeler 2007; Wheeler et al. 2008). According to a report in *The Times Educational Supplement*, of the 10 out of 85 teacher training institutions in England and Wales who replied to a question on training in ADHD, 'Six hours training during a three-year course was the most offered. Three colleges offered nothing, one said two hours and the others an hour or less. Two admitted they offered ten minutes' (Stewart 2006, 23).

Conclusions

To return to the question in the title of Visser and Jehan's (2009) article, it is virtually impossible to give a definitive answer as to whether ADHD is a scientific fact or a factual opinion but it is essential that research continues to be undertaken and that questions continue to be asked. The wide-ranging list of references provided by Visser and Jehan encourages further reading and debate on the concept of ADHD.

This article has suggested that the fact that there are questions regarding the existence of ADHD as a medical category could point to uncertainty about the use of diagnostic classifications and medication. The ADHD 'label' provides access to resources and support. Even those who do not acknowledge the existence of ADHD, as diagnosed using DSM-IV criteria (APA 2000), can be in no doubt that there may be approximately 5% of the school population in the UK who display some or all of the features of inattention, hyperactivity, impulsivity and associated difficulties in classroom settings. It is necessary for those pupils to be identified so that they can receive the appropriate support. There has been research focusing on an examination of medication as an intervention, but there is still a need for further research into: (a) the long-term effects of different types of medication; (b) different formulations of medication; and (c) pupils' and parents' perceptions of the positive and negative effects of medication.

By moving away from 'the unhelpful polarity that is sometimes stated in terms of biological versus social explanations for learning and behavioural problems' (Cooper 2008, 461), the bio-psychosocial discourse accepts aspects of both the biomedical discourse and the sociological discourse. This perspective seems reasonable, bearing in mind that a review of the literature suggests that there is no one single cause of ADHD (Wheeler 2007). This means that effective multi-agency and multi-professional working is essential, from the early stages of assessment and diagnosis right through to the regular monitoring of the effectiveness of interventions. 'The key implication of (the) bio-psychosocial perspective for education is that the more we understand about the biological and psychosocial correlates of ADHD . . . the better placed we will be to provide educational environments that avoid exacerbating difficulties that children may experience and that promote their optimal educational engagement' (Cooper 2008, 465).

Visser and Jehan have provided an extremely interesting and thought-provoking contribution to the discussion on ADHD, concluding that ‘with no end to the debate in sight, the biomedical “truth” of ADHD remains a hypothetical disorder with uncertain foundations’ (2009, 136). It is essential that the debate continues.

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