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The influence of adult attention deficit hyperactivity disorder (ADHD) symptoms on adjustment to university

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The Influence of Adult Attention Deficit Hyperactivity Disorder (ADHD)

Symptoms on Adjustment to University.

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The University of Wales Bangor

June 2005

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Abstract

Attention Deficit Hyperactivity Disorder (ADHD) is a developmental neurobiological condition characterised by elevated levels of inattention, and or hyperactivity and impulsive behaviours that arise in early childhood and cause functional impairment in multiple settings. Originally conceptualised as a disorder of childhood ADHD is now considered a valid clinical entity in adulthood, associated with significant impairment in cognitive, educational, vocational and interpersonal domains.

ADHD is associated with different sets of challenges at each developmental stage.

This thesis reviews the emerging literature examining ADHD in adulthood and considers the evidence suggesting the disorder is associated with increased risk for specific impairment in multiple domains.

This study explored the influence of ADHD symptoms on young adults' adjustment to university life across three domains: academic achievement, self-esteem and interpersonal competence. University students (N= 109) completed measures of current and retrospective ADHD, depression, anxiety, aggression, self-esteem and interpersonal competence. Permission was sought to obtain information regarding each students academic performance. Results indicated that higher levels of ADHD symptoms were associated with poorer academic achievement but not with lower self-esteem or interpersonal communication difficulties. The strengths and limitations of the research are outlined, and finally the contributions to theory, research and clinical practice are presented.

Acknowledgements

I would like to thank all the undergraduate psychology students at the University of Wales Bangor who gave their time to participate in this research.

My greatest thanks to Dr Dave Daley who supervised this research, I am extremely grateful for all his advice and guidance and for his endless patience.

I would also like to thank Dr Stuart Paynter, for his kindness in the time I was stuck in a moment.

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My thanks also go to my family for their endless emotional support and encouragement throughout my clinical training.

Finally and most importantly I would like to thank my husband Martin Dodd for being there through the deadlines, and for his infinite support, reassurance and love.

SECTION ONE: ETHICS PROPOSAL

School of Psychology Research Ethics Committee, UWB

Title of Project

The Influence of Adult Attention Deficit Hyperactivity Disorder (ADHD) Symptoms on Adjustment to University.

Name of Investigator(s)

Kelly Taylor, Trainee Clinical Psychologist NWCPP, University of Wales Bangor,
James Birchwood, PhD Student, University of Wales Bangor,
Dr D. Daley, Research Tutor, NWCPP, University of Wales Bangor,
Dr E. Burnside, Research Tutor, NWCPP, University of Wales Bangor.

The potential value of addressing this issue

While originally conceived of as a disorder of childhood there is now both scientific merit and clinical value in investigating ADHD in adulthood. While studies of the disorder in childhood emphasize the impact of ADHD symptoms on childhood adjustment, specifically on school performance and peer relationships, few studies to date have examined similar processes in adults.

Brief background to the study

ADHD is a developmental, neurobiological condition defined by the presence of severe and pervasive symptoms of inattention, over activity and impulsivity (Barkley, 1990; DSM-IV APA, 1994). Historically ADHD has been conceptualized as a condition limited to school aged children (Sonuga-Barke et al., 2003; Lahey et al., 1998). More recently ADHD has been understood as a chronic, debilitating condition with early onset that may persist into adolescence and adulthood (Barkley et al., 1998; Stevenson et al., 2003). A prevalence rate of between 2 and 6% of the adult population has been reported (Wender, 1995). However Young (2004) cautions that adult ADHD may be under diagnosed as a consequence of diagnostic thresholds for childhood ADHD being too rigidly applied. Evidence from longitudinal studies suggests that activity levels are likely to decrease with age, concentration is likely to improve but impulsivity has been shown as a core residual feature of the disorder (Fischer et al., 1993; Young et al., 2001). Diagnostic thresholds may therefore need to be revised when applied to adults in order to take account of the developmental course of ADHD and therefore prevent under diagnosis. Despite increasing recognition of the clinical value of diagnosing ADHD in adulthood, adult ADHD to date has received little research attention and is not typically treated as an adult psychiatric disorder (Young et al., 2003).

Childhood ADHD is associated with significant social impairment and academic underachievement (Biederman et al., 1996). Children with ADHD are also at increased risk of socially aggressive behaviours, parent conflict, peer rejection, poor self-esteem and developing psychopathology (Shelton et al., 1998; Pierce et al., 1999; Weiss and Hechtman, 1993). Researchers have argued that if childhood symptoms of

ADHD persist beyond adolescence then adults with ADHD should experience functional impairments in domains correlated to childhood ADHD.

Academic underachievement is a recognized correlate of ADHD in childhood (Hinshaw, 1992). The behavioural symptoms of ADHD inattention, impulsivity and over activity have consistently been shown to place children at increased risk of current and future academic underachievement (DeShazo Barry et al., 2002; Rapport et al., 1999), including attaining poorer marks, failing grades more frequently, being more commonly expelled and completing less education than non ADHD peers (Biederman et al., 1993; Klein & Mannuzza, 1991). The relationship between academic underachievement and ADHD appears to be specific to ADHD related behaviours and independent of comorbid conduct problems (Gadow et al., 2002; Rapport et al., 1999). Researchers have suggested that a number of variables are implicated in predicting academic underachievement in childhood ADHD including, symptom severity (DeShazo Barry et al., 2002) and cognitive variables such as working memory, and attentional capacity (Rapport et al., 1999). Studies have shown that adults' with ADHD have academic histories that reflect the expected academic underachievement predicted by childhood ADHD (Biederman et al., 1993; Murphy and Barkley, 1996). Indeed preliminary data suggests that academic difficulties in school aged children with ADHD continue to be experienced in the college years (Heiligenstein and Keeling, 1995; Heiligenstein et al., 1999).

It has long been recognized that children diagnosed with ADHD are significantly impaired in the domain of social relationships (Fredrick & Olmi, 1994; Barkely, 1990). Some studies have indicated that children with ADHD are also more likely to experience peer rejection than children with other externalising behaviour disorders or their non-disordered age related peers (Hinshaw& Melnick, 1995).

It has been argued that peer rejection may result from peers finding patterns of behaviour characteristic of ADHD e.g. interrupting conversation, inability to turn take and lacking awareness of the impact of their behaviour on others, intolerable (Mikami & Hinshaw, 2003). Studies have demonstrated that children with ADHD display deficits in social skills (Greene et al., 1996; Weiss & Hechtman, 1993). Given the importance of social skills for adaptive social and emotional functioning notwithstanding peer group acceptance it appears important to determine whether deficits in social skills persist into adulthood and subsequently predispose adult with ADHD to impoverished interpersonal relationships (Rapport et al., 2002).

Extant research on the association between ADHD and lowered self-esteem is more uncertain. The self perception of adults' with ADHD has not been widely investigated and there is a need for more research into the relationship between adult ADHD and self-esteem particularly in regard to implications for current adjustment and future psychological wellbeing.

The present study investigates the influence of adult ADHD on university adjustment when other forms of psychopathology namely aggression, depression and anxiety are controlled.

The hypotheses

Higher levels of ADHD symptoms will be associated with greater problems with university adjustment.

Specifically we predict

- i) Higher ADHD symptoms will be associated with poorer academic performance
- ii) Higher ADHD symptoms will be associated with lower self-esteem
- iii) Higher ADHD symptoms will be associated with poorer interpersonal competence
- iii) That self-esteem and /or interpersonal competence mediate the relationship between ADHD symptoms and academic performance.

Recruitment of participants

First and second year undergraduate Psychology students will be recruited via the School of psychology participant pool. All first and second year will be e-mailed an information letter, consent letter and questionnaire pack. Participants who would like to participate in the study will be required to read the information letter, answer questions on the consent letter, and then complete the questionnaire pack on-line. Participants will also be asked to forward one of the questionnaires (Adult ADHD Rating Scale) to a close friend for them to complete about the participant. Return of the completed consent form with the consent to participate questions ticked and the questionnaire pack will be taken as informed consent to participate in the study. A link to the study questionnaire pack will also be available on SONA. To minimize inconvenience to participants this questionnaire study will also act as the screening phase for another study which will be conducted by three undergraduates, and has already been granted ethical permission. This study intended to screen first and second year students using the Adult ADHD Rating Scale, to identify high and low scores for a series of neuropsychology studies. Rather than administer the same measure twice, a simple consent statement to be contacted about a follow-up study will be added to this study's consent form.

Research design

This will be a cross-sectional questionnaire study; no exclusion criteria will apply to this study.

Procedures employed

Data will be collected online via e-mail or SONA.

Measures employed

Adult ADHD Rating Scale (AARS; Barkley and Murphy, 1998). This is a self-report scale with 18 items based on the DSM-IV symptom list spanning inattentiveness (9 items), impulsiveness (3 items) and hyperactivity (6 items). Adults rate their own behavior over the past 6 months on a 4 point scale (0 = rarely; 1 = sometimes; 2 = often; 3 = very often). The scale as a whole and the inattention and impulsive/overactive sub-scales within it have good internal consistency and also predict concurrent ratings provided by spouses, parents, and cohabiting partners about the participants themselves (Edwards, Barkley, Laneri, Fletcher, & Metevia, 2001; Murphy and Barkley, 1996; Murphy and Schachar, 2000).

The Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983). This self-report scale with 14 items assesses anxiety and depression. Bjelland, Dahl, Haug & Neckelmann (2002) in a review of the HADS report widespread agreement on its psychometric properties. For example most factor analyses demonstrate a two factor solution, HADS anxiety and HADS depression. The correlations between the two sub-scales vary from 0.40 to 0.74. Cronbach's alpha for HADS anxiety varied from 0.68 to 0.93 (mean 0.83) and for HADS depression from 0.67 to 0.90 (mean 0.82). Correlations between the HADS and other commonly used measure ranged from 0.49 to 0.83.

The Aggression Questionnaire, short form (AQ; Bryant & Smith 2000). This 12 item self-report scale, based on the original 27 item scale from Buss & Perry (1992) consists of 4, 3 item factors measuring physical aggression, verbal aggression, anger and hostility. Adults rate their own behaviour on a scale of 1 – 6 (1 = extremely uncharacteristic of me to 6 extremely characteristic of me). Bryant & Smith (2000) report Cronbach's alpha scores ranging from 0.70 to 0.83 for factors of the AQ. Using structural equation modeling they also tested the comparability of the factors represented in the short and long forms of the AQ, and reported that shortening the AQ to 12 items did not appear to change the conceptual meaning of the underlying aggression subtraits.

Rosenberg Self-esteem Scale (RSE Rosenberg 1965). This is a 10 item measure of global self-esteem on which respondents rate their feeling of self acceptance, self respect and positive self evaluation. The scale has been show to have acceptable levels of reliability and validity with test retest reliability of 0.85 over a two week period, and internal consistency of 0.88 in adolescent populations (Barrett, Webster & Wallis 1999).

Interpersonal Competence Questionnaire (ICQ Buhrmeser, Furman, Wittenberg & Reis, 1988). This is a 40 item questionnaire designed to test 5 domains of interpersonal competence. Only 3 of the five sub-scales (24 items) will be used for this study, Initiating Relationships, Emotional Support and Interpersonal Conflict. The measure as a whole and its sub-scales has excellent psychometrics.

Sociometric measure of peer status (Miller-Johnston et al 2003). This is a measure of social preference which yields ratings of peer status. To asses peer status students will be asked to identify 10 classmates whom they "liked most (LM)" and "liked least (LL)". Social preference and social impact scores will then be computed. Social preference will be the difference between LM and LL while social impact will be the aggregate of LM and LL. Sociometric surveys have been shown to have good validity in terms of predicting behavioural outcomes and good concurrent validity (Coie et al., 1992).

Friendship Frequency Measure. This is a self report measure recording participants number of friends in the class, and a rating of how popular they think they are. This short measure has been specifically created for this study.

Wender Utah Rating Scale (WURS, Ward, Wender & Reimher, 1993). The abbreviated WURS is a 25 item questionnaire that can be used with adults to retrospectively yield estimated scores for their ADHD symptoms during childhood. Scores on the WURS correlate with retrospective reports of childhood symptoms by parents. The measure has excellent internal consistency ($\alpha = 0.91$) and good retest stability (Ward et al 1993).

Academic performance. This will consist of Semester one exam and coursework results, aggregated into a percentage. This measure will not be collected from participants, but will be collected directly from the School of Psychology with the participant's permission. The researchers have already verified that the procedure proposed in this study adheres to the university's data protection policy and a print out of this confirmation is appended.

Qualifications of the investigators to use the measures.

The measures used do not require specific training. However, the supervisor has used the measures in previous studies and can provide appropriate support.

Venue for investigation

School of Psychology, University of Wales, Bangor.

The duration of the study

20/11/2004 until 20/06/2005

Data analysis

Data will be entered into SPSS data file and cleaned for missing items and outliers. The internal consistency of all measures will be checked. Formal analysis will be conducted in three stages. i) Influences of demographic variables on psychopathology scores, self-esteem, interpersonal competence, and academic performance will be examined. This will help to identify variables, which may need to be controlled for in subsequent analyses. ii) Regression analysis will be employed to evaluate the influence of ADHD symptoms on self-esteem, interpersonal competence and academic performance, iii) Further regression analysis will then be conducted to investigate whether self-esteem, or interpersonal competence mediate the relationship between ADHD symptoms and academic performance.

Potential hazards to participants / investigators

None are expected

Potential offence / distress to participants

It is highly unlikely that completing this questionnaire pack will cause any distress to participants, however in the unlikely event that distress will be caused; the contact number the Samaritans will be included at the end of the questionnaire pack.

Procedures to ensure confidentiality

The study will require participants to identify themselves so that research credits and printer credits can be allocated to participants. To protect the identity of respondent's, data will be anonymised on receipt by allocating each participant a number. Only participant's numbers will be entered onto the data base. All data will be stored on an encrypted laptop. Once data entry has been completed all paper and electronic versions of the questionnaires will be destroyed.

How consent is to be obtained

Return of the completed consent form with the consent to participate questions ticked and the questionnaires will be taken as informed consent to participate. Consent forms will be available in both Welsh and English

Information for participants

All first and second year undergraduate Psychology students will be e-mailed an information letter about the study. The information letter will be available in both Welsh and English. Students who would like to participate in the study will be required to read the information letter, and complete an e-mailed consent form. They will then be asked to complete the questionnaire pack on-line. Participants will also be asked to forward one of the questionnaires to a close friend for them to complete on-line, in relation to the participant.

Approval of relevant

Approval from relevant professionals is not required for this study.

Payment to: participants/investigators/departments / institutions

Each participant will be given 1 course credit and two pounds of printer credits for participating. No payment will be made available for participants close friends. Receipt of course and printer credits will not be dependent upon participant's friend's participation.

Equipment required and its availability

No equipment is required for this study.

What arrangements you are making to give feedback to participants

All participants will be sent a summary of the study in July 2005

Does the proposal conform to BPS Guidelines on Ethical Standards in research?

This research project will be carried out in accordance with the guidelines laid down by the British Psychological Society and the procedures determined by the School of Psychology at Bangor.

(Revised 3.11.00.)

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APPENDIX A
RESEARCH PROTOCOL

North Wales Clinical Psychology Programme (NWCPP)

Large Scale Research Project (LSRP)

Research Proposal

Title of Project

The Influence of Adult Attention Deficit Hyperactivity Disorder (ADHD) Symptoms on Adjustment to University.

Name of Investigator(s)

Kelly Taylor, Trainee Clinical Psychologist NWCPP, University of Wales Bangor,
James Birchwood, PhD Student, University of Wales Bangor,
Dr D. Daley, Research Tutor, NWCPP, University of Wales Bangor,
Dr E. Burnside, Research Tutor, NWCPP, University of Wales Bangor.

Background

ADHD is a developmental, neurobiological condition defined by the presence of severe and pervasive symptoms of inattention, over activity and impulsivity (Barkley, 1990; DSM-IV APA, 1994). DSM-IV subtypes the disorder into 3 categories: ADHD combined type with symptoms of inattention and hyperactivity; ADHD predominantly inattentive type without hyperactivity; and ADHD predominantly hyperactive without inattention. Historically ADHD has been conceptualised as a condition limited to school aged children (Sonuga-Barke et al., 2003; Lahey et al., 1998). More recently ADHD has been understood as a chronic, debilitating condition with early onset that may persist into adolescence and adulthood (Barkley et al., 1998; Stevenson et al., 2003). There has been increasing acceptance that childhood ADHD symptoms can continue into adolescence and adulthood, with a reported prevalence of between 2 and 6% of the adult population (Wender, 1995).

Young (2004) cautions that adult ADHD may be under diagnosed as a consequence of diagnostic thresholds for childhood ADHD being too rigidly applied. Evidence from longitudinal studies suggests that activity levels are likely to decrease with age, concentration is likely to improve but impulsivity has been shown as a core residual feature of the disorder (Fischer et al., 1993; Young et al., 2001). Diagnostic

thresholds may therefore need to be revised when applied to adults in order to take account of the developmental course of ADHD and therefore prevent under diagnosis. Despite increasing recognition of the clinical value of diagnosing ADHD in adulthood, adult ADHD to date has received little research attention and is not typically treated as an adult psychiatric disorder (Young et al., 2003).

The precise aetiology of ADHD is not currently known however both genetic and environmental factors are thought to contribute to the development of the condition. Twin and familial studies provide strong evidence for genetic factors influencing attention and activity levels (Gjone et al., 1996), and the condition is also considered highly heritable (Todd et al., 2001). Farone and colleagues (1996) found that 84% of adults with ADHD had at least one child with a diagnosis of ADHD. Levy et al., (1997) reported higher concordance rates of 51% to 82% for monozygotic twins. ADHD is a heterogeneous disorder in its clinical expression and it is likely that there is more than one developmental pathway in the aetiology of ADHD.

From a neuropsychological perspective (Barkley et al., 1992) ADHD is conceptualised as a disorder characterised by deficient inhibitory control. Deficits in executive function have consistently been associated with ADHD in school aged children (Sonuga-Barke et al., 2003). For example children with ADHD exhibit poor planning, impaired working memory (Mariani & Barkley, 1997), deficient attentional and strategic flexibility (Hughes et al, 2000), and an inability to effectively monitor and self regulate behaviour (Biederman et al., 1993) have all been associated with ADHD.

Alternative models have been proposed to account for the psychological mechanisms underpinning ADHD. These models are based on motivational processes rather than deficits in executive function (Haenlein & Caul, 1987; Johannesssen et al., 2002). One such model is the delay aversion model where it is hypothesized that core symptoms of ADHD reflect a functional expression of aversion to delay of rewards (Sonuga-Barke, 1994).

However a recent study (Solanto et al., 2001) evaluated the contribution each of the competing models (i.e. deficient inhibitory control and delay aversion) makes to advancing scientific and clinical understanding of ADHD. The study concluded that deficient inhibitory control and delay aversion are central, co-existing but none the less independent features of ADHD (combined type).

Building upon these findings Sonuga-Barke (2002) proposed a dual pathway model of the development of ADHD that attempts to reconcile the competing accounts for ADHD. This model postulates that the development of ADHD is underpinned by two coexisting pathways and recognizes two distinct subtypes of the disorder. In the first subtype ADHD is mediated by executive dysfunction of action and thought as a consequence of deficient inhibitory control. In the other subtype of the disorder motivational processes based on aversion to reward related delays are implicated. The dual pathway model proposed by Sonuga-Barke (2002) has recently been evaluated in a study of school aged children with ADHD (Taylor, 1999). The study supported the dual pathway model, demonstrating the independent, coexistence of delay aversion and deficient inhibitory control in ADHD.

Childhood ADHD is associated with significant social impairment and academic under achievement (Biederman et al., 1996). Children with ADHD are also at increased risk of socially aggressive behaviours, parent conflict, peer rejection, poor self-esteem and developing psychopathology (Shelton et al., 1998; Pierce et al., 1999; Weiss & Hechtman, 1993).

Researchers have argued that if childhood symptoms of ADHD persist beyond adolescence then adults with ADHD should experience functional impairments in domains correlated to childhood ADHD.

Academic underachievement is a recognized correlate of ADHD in childhood (Hinshaw, 1992). The behavioural symptoms of ADHD inattention, impulsivity and over activity have consistently been shown to place children at increased risk of current and future academic underachievement (DeShazo Barry et al., 2002; Rapport et al., 1999), including attaining poorer marks, failing grades more frequently, being more commonly expelled and completing less education than non ADHD peers (Biederman et al., 1993; Klein & Mannuzza, 1991). The relationship between academic underachievement and ADHD appears to be specific to ADHD related behaviours and independent of comorbid conduct problems (Gadow et al., 2002; Rapport et al., 1999). Researchers have suggested that a number of variables are implicated in predicting academic underachievement in childhood ADHD including,

symptom severity (DeShazo Barry et al., 2002) and cognitive variables such as working memory, and attentional capacity (Rapport et al., 1999).

Studies have shown that adults with ADHD have academic histories that reflect the expected academic underachievement predicted by childhood ADHD (Biederman et al., 1993; Murphy and Barkley, 1996). Indeed preliminary data suggests that academic difficulties in school aged children with ADHD continue to be experienced in the college years (Heiligenstein and Keeling, 1995; Heiligenstein et al., 1999).

It has long been recognised that children diagnosed with ADHD are significantly impaired in the domain of social relationships (Fredrick & Olmi, 1994; Barkely, 1990) some studies have indicated that children with ADHD are also more likely to experience peer rejection than children with other externalising behaviour disorders or their non disordered age related peers (Hinshaw& Melnick, 1995).

It has been argued that peer rejection may result from peers finding patterns of behaviour characteristic of ADHD e.g. interrupting conversation inability to turn take and lacking awareness of the impact of their behaviour on others, intolerable (Mikami & Hinshaw, 2003). Studies have demonstrated that children with ADHD display deficits in social interaction skills (Greene et al., 1996; Weiss & Hechtman, 1993). Given the importance of social interaction skills for adaptive social and emotional functioning notwithstanding peer group acceptance it appears important to determine whether deficits in social interaction skills persist into adulthood and subsequently predispose adult with ADHD to impoverished interpersonal relationships (Rapport et al., 2002).

Extant research on the association between ADHD and lowered self-esteem is more uncertain. Until relatively recently few studies have investigated the self perceptions of children with ADHD. Over the last decade two divergent viewpoints have begun to emerge from the literature. Some researchers have argued that children with ADHD display a 'positive illusory bias' (Taylor & Brown, 1989) in their self perception that is, they hold overly positive perceptions of their functioning abilities (Hoza et al., 1993; Gresham et al., 1998). Other researchers contend that children with ADHD are at increased risk for low self-esteem (Slomkowski et al., 1995; Treuting& Hinshaw, 2001). There is a need for more research into the relationship between adult ADHD and self-esteem particularly in regard to implications for current adjustment and future psychological wellbeing.

The present study investigates the influence of adult ADHD on university adjustment across three domains: academic achievement, peer relationships and self-esteem.

Research question

What is the influence of adult ADHD on university adjustment across three domains: academic achievement, peer relationships and self-esteem? It is hypothesised that: Higher levels of ADHD symptoms will be associated with greater problems with university adjustment.

Specifically it is predicted that:

- i) Higher ADHD symptoms will be associated with poorer academic performance.
- ii) Higher ADHD symptoms will be associated with lower self-esteem.
- iii) Higher ADHD symptoms will be associated with poorer interpersonal competence.

Participant Recruitment

Participants will be recruited from the 2004 and the 2003 intake of psychology undergraduates from the University of Wales Bangor.

Research design

This will be a cross-sectional questionnaire study; no exclusion criteria will apply to this study. First and second year undergraduate Psychology students will be recruited via the School of psychology participant pool. All first and second year will be e-mailed an information letter, consent letter and questionnaire pack. Participants who would like to participate in the study will be required to read the information letter, answer questions on the consent letter, and then complete the questionnaire pack online. Participants will also be asked to forward one of the questionnaires to a close friend for them to complete in relation to the participant. Return of the completed consent form with the consent to participate questions ticked and the questionnaire pack will be taken as informed consent to participate in the study. A link to the study questionnaire pack will also be available on SONA.

Measures

Adult ADHD Rating Scale (AARS; Barkley and Murphy, 1998). This is a self-report scale with 18 items based on the DSM-IV symptom list spanning inattentiveness (9 items), impulsiveness (3 items) and hyperactivity (6 items). Adults rate their own behaviour over the past 6 months on a 4 point scale (0 = rarely; 1 = sometimes; 2 = often; 3 = very often). The scale as a whole and the inattention and impulsive/overactive sub-scales within it have good internal consistency and also predict concurrent ratings provided by spouses, parents, and cohabiting partners about the participants themselves (Edwards, Barkley, Laneri, Fletcher, & Metevia, 2001; Murphy and Barkley, 1996; Murphy and Schachar, 2000).

The Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983). This self-report scale with 14 items assesses anxiety and depression. Bjelland, Dahl, Haug & Neckelmann (2002) in a review of the HADS report widespread agreement on its psychometric properties. For example most factor analyses demonstrate a two factor solution, HADS anxiety and HADS depression. The correlations between the two sub-scales vary from 0.40 to 0.74. Cronbach's alpha for HADS anxiety varied from 0.68 to 0.93 (mean 0.83) and for HADS depression from 0.67 to 0.90 (mean 0.82). Correlations between the HADS and other commonly used measure ranged from 0.49 to 0.83.

The Aggression Questionnaire, short form (AQ; Bryant & Smith 2000). This 12 item self-report scale, based on the original 27 item scale from Buss & Perry (1992) consists of 4, 3 item factors measuring physical aggression, verbal aggression, anger and hostility. Adults rate their own behaviour on a scale of 1 – 6 (1 = extremely uncharacteristic of me to 6 extremely characteristic of me). Bryant & Smith (2000) report Cronbach's alpha scores ranging from 0.70 to 0.83 for factors of the AQ. Using structural equation modelling they also tested the comparability of the factors represented in the short and long forms of the AQ, and reported that shortening the AQ to 12 items did not appear to change the conceptual meaning of the underlying aggression subtraits.

Rosenberg Self-esteem Scale (RSE Rosenberg 1965). This is a 10 item measure of global self-esteem on which respondents rate their feeling of self acceptance, self respect and positive self evaluation. The scale has been show to have acceptable levels of

reliability and validity with test retest reliability of 0.85 over a two week period, and internal consistency of 0.88 in adolescent populations (Barrett, Webster & Wallis 1999).

Interpersonal Competence Questionnaire (ICQ Buhrmeser, Furman, Wittenberg & Reis, 1988). This is a 40 item questionnaire designed to test 5 domains of interpersonal competence. Only 3 of the five sub-scales (24 items) will be used for this study, Initiating Relationships, Emotional Support and Interpersonal Conflict. The measure as a whole and its sub-scales have excellent psychometrics.

Sociometric measure of peer status (Miller-Johnston et al 2003). This is a measure of social preference which yields ratings of peer status. To assess peer status students will be asked to identify 10 classmates whom they “liked most (LM)” and “liked least (LL)”. Social preference and social impact scores will then be computed. Social preference will be the difference between LM and LL while social impact will be the aggregate of LM and LL. Sociometric surveys have been shown to have good validity in terms of predicting behavioural outcomes and good concurrent validity (Coie et al., 1992).

Friendship Frequency Measure. This is a self report measure recoding participants number of friends in the class, and a rating of how popular they think they are. This short measure has been specifically created for this study.

Wender Utah Rating Scale (WURS, Ward, Wender & Reimher, 1993). The abbreviated WURS is a 25 item questionnaire that can be used with adults to retrospectively yield estimated scores for their ADHD symptoms during childhood. Scores on the WURS correlate with retrospective reports of childhood symptoms by parents. The measure has excellent internal consistency ($\alpha = 0.91$) and good rest retest stability (Ward et al 1993).

Academic performance. This will consist of Semester one exam and coursework results, aggregated into a percentage. This measure will not be collected from participants, but will be collected directly from the School of Psychology with the participant's permission.

Data management and analysis

Data collected will be anonymised. Electronic data will be protected in the usual way including the use of a key board lock. Data will be entered into SPSS data file and cleaned for missing items and outliers. The internal consistency of all measures will be checked. Formal analysis will be conducted in three stages. i) Influences of demographic variables on psychopathology scores, self-esteem, interpersonal competence, and academic performance will be examined. This will help to identify variables, which may need to be controlled for in subsequent analyses. ii) Regression analysis will be employed to evaluate the influence of ADHD symptoms on self-esteem, interpersonal competence and academic performance, iii) Further regression analysis will then be conducted to investigate whether self-esteem, or interpersonal competence mediate the relationship between ADHD symptoms and academic performance.

Proposed journal

Journal of Abnormal Psychology.

Ethical /Registration issues

School of Psychology Research Ethics Committee approval will be obtained before conducting any research relating to this study. This research project will be carried out in accordance with the guidelines laid down by the British Psychological Society and the procedures determined by the School of Psychology at Bangor.

Feedback

All participants will be sent a summary of the study in July 2005.

Risk assessment

It is highly unlikely that completing this questionnaire pack will cause any distress to participants, however in the unlikely event that distress will be caused; the contact number for both the University Counselling Service and Samaritans will be included at the end of the questionnaire pack.

Data storage

Electronic data will be anonymised. At the end of the study the research will be written up submitted for publication and all data will be forwarded to the research supervisor for storage.

Financial information

No equipment is required to be purchased for this study. Photocopying and postage and stationary costs are not required as all information and questionnaires relating to the study will be e-mailed to participants.

Approximately 400 adults are anticipated to participate in the study. Each participant will be given 1 course credit and two pounds of printer credits for participating.

400 x £2=£800

Time table

- November 2004-apply for School of Psychology Research Ethics Committee approval
- December 2004-February-2005 data collection.
- January 2005- first draft of the literature review.
- February-March-2005 - data analyses
- February-March-2005 first draft of the research paper
- April-2005- write up discussion paper
- May 2005-revisions
- June 2005-hand in.

Supervisors.....

Date.....

Trainee.....

Date.....

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APPENDIX B
INFORMATION SHEETS AND CONSENT FORMS
(ENGLISH AND WELSH VERSIONS)

Information for participants

Study Title

The Influence of Adult Attention Deficit Hyperactivity Disorder (ADHD) Symptoms on Adjustment to University.

Researcher(s)

Kelly Taylor, Trainee Clinical Psychologist, NWCCP, University of Wales Bangor,
James Birchwood, PhD Student, University of Wales Bangor,
Dr. D. Daley, Senior Research Tutor, NWCCP, University of Wales Bangor,
Dr. E. Burnside, Research Tutor, NWCCP, University of Wales Bangor.
Dr. M. Hoerger, University of Wales, Bangor.

Invitation to participate

You are being invited to take part in a research study. Before you decide to take part it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Please contact me by e-mail, which will be provided at the end of this letter if there is anything that is not clear or if you would like more information.

What is the purpose of the study?

While originally conceived of as a disorder of childhood there is now both scientific merit and clinical value in investigating ADHD in adulthood. While studies of the disorder in childhood emphasize the impact of ADHD symptoms on childhood adjustment, specifically on school performance and peer relationships, few studies to date have examined similar processes in adults. This study aims to investigate whether higher levels of ADHD symptoms will be associated with greater problems with university adjustment.

What are the benefits of taking part in the research?

Despite increasing recognition that ADHD persists into adulthood, to date there has been little research attention in this area. By taking part in this research you will be helping to advance scientific understanding of the impact ADHD symptoms may have upon an individual's adjustment to university life across three domains: self-esteem, interpersonal relationships and academic performance.

Do I have to take part?

It is up to you whether or not you decide to participate. If you decide to take part, you are still free to withdraw at any time without giving a reason.

What will happen if you take part in the research?

Any requests for further information or questions about the research will be dealt with as effectively as possible. You will then be asked to complete on-line the consent

form, and questionnaire pack that has been e-mailed to you. The questionnaires will take approximately 15 to 20 minutes to complete. A link to the study questionnaire pack will also be available on SONA. Participants will also be asked to forward one of the questionnaires to a close friend for them to complete about you. We would also like your permission to access your exam results for Semester one and two. With your permission we would collect from the school of Psychology's exam data-base a score representing your average exam performance. All information collected during the course of the study will be anonymised. Results of the study will describe overall findings and not information about individuals. All participants will be sent a summary of the study in July 2005. As this study is being conducted via e-mail we are not asking you to give signed consent, but consider the provision of your student ID number as a substitute for your signature.

What do I do now?

If you decide to take part, please complete the consent form and proceed to fill in the questionnaires.

Further details

If you want to contact the investigator about the research the details are below:

Kelly Taylor, Trainee Clinical Psychologist

James Birchwood PhD student

E-mail: kellytaylordodd@aol.com

E-mail: psp00e@bangor.ac.uk

If you have any complaints about the way that this research is being conducted you are welcome to address unresolved concerns to:

Professor Fergus Lowe,
Head of the School of Psychology,
University of Wales Bangor,
Bangor,
Gwynedd
LL57 2AS

Consent form

Study Title

The influence of adult Attention Deficit Hyperactivity Disorder (ADHD) symptoms on adjustment to university.

Researcher(s)

Kelly Taylor, Trainee Clinical Psychologist, NWCCP, University of Wales Bangor,
James Birchwood, PhD Student, University of Wales Bangor,
Dr. D. Daley, Research Tutor, NWCCP, University of Wales Bangor,
Dr. E. Burnside, Research Tutor, NWCCP, University of Wales Bangor.
Dr. M. Hoerger, University of Wales, Bangor.

Please select the appropriate response

1. I have read and understand the information letter for the above study.

YES NO

2. I understand that my participation is voluntary and that I can withdraw at any time with out giving a reason.

YES NO

3. I agree to take part in this study.

YES NO

4. I give consent for the School of Psychology to release my academic grades in an aggregated form to the research team for use in this study.

YES NO

5. I agree to forward the Adjustment Questionnaire to a close friend so they can answer some questions about me

YES NO

6. I agree to provide my name and user ID in order to receive course and printer credits.

YES NO

7. I would be willing to be contacted about participating in a future neuropsychology study

YES NO

PSU Number

Student ID number 5000

The number on your assignment front cover sheets

Age (yrs)

Gender (M/F)

Information for secondary participants

The person who has forwarded this document to you has agreed to participate in the research study detailed below. You are being asked to complete a short questionnaire about that person, as they have nominated you are a friend who knows them well.

Please answer the questions in relation to the person who forwarded you this questionnaire **not about yourself**.

Study Title

The Influence of Adult Attention Deficit Hyperactivity Disorder (ADHD) Symptoms on Adjustment to University.

What is the purpose of the study?

This study aims to investigate whether higher levels of ADHD symptoms will be associated with greater problems with university adjustment. While studies of the disorder in childhood emphasize the impact of ADHD symptoms on childhood adjustment, specifically on school performance and peer relationships, few studies to date have examined similar processes in adults. It is hoped that the information gathered in from this study will advance scientific knowledge of ADHD in adulthood.

If you are willing to complete this questionnaire then please tick the consent boxes below.

1. I have read and understand the information letter for the above study.

YES NO

2. I understand that my participation is voluntary and that I can withdraw at any time with out giving a reason.

YES NO

3. I agree to take part in this study.

YES NO

Yours sincerely

Kelly Taylor
Trainee Clinical Psychologist

James Birchwood
PhD student

If you want to contact the investigator about the research the details are below:

Kelly Taylor, Trainee Clinical Psychologist
E-mail: kellytaylordodd@aol.com

If you have any complaints about the way that this research is being conducted you are welcome to address unresolved concerns to:

Professor Fergus Lowe,
Head of the School of Psychology,
University of Wales Bangor,
Gwynedd LL57 2AS

Thank you for taking time to complete the questionnaire

Gwybodaeth i Gyfranogwyr

Teitl yr Astudiaeth

Dylanwadau Symptomau Anhwylder Diffyg Canolbwyntio a Gorfywiogrwydd (ADCG) ymysg Oedolion ar Ymaddasu i Fywyd Prifysgol.

Ymchwilydd / Ymchwilwyr

Kelly Taylor, Seicolegydd Clinigol dan Hyfforddiant, Rhaglen Seicoleg Glinigol Gogledd Cymru, Prifysgol Cymru, Bangor,

James Birchwood, Myfyriwr PhD, Prifysgol Cymru, Bangor,

Dr. D. Daley, Uwch Diwtor Ymchwil, Rhaglen Seicoleg Glinigol Gogledd Cymru, Prifysgol Cymru, Bangor,

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Gwahoddiad i gymryd rhan

Mae gwahoddiad ichi gymryd rhan mewn astudiaeth ymchwil. Cyn ichi gytuno i gymryd rhan, mae'n bwysig eich bod yn deall y rheswm dros wneud yr ymchwil a'r hyn y bydd yn ei olygu. Cymerwch amser i ddarllen y wybodaeth isod yn ofalus a'i thrafod ag eraill, os dymunwch. Cysylltwch â mi trwy'r cyfeiriad e-bost a gewch ar ddiwedd y llythyr os ydych yn ansicr ynglŷn â rhywbeth, neu os hoffech gael mwy o wybodaeth.

Beth yw diben yr astudiaeth hon?

Er mai fel anhwylder ymysg plant y meddylid yn wreiddiol am ADCG, ceir bellach gyfiawnhad gwyddonol a gwerth clinigol hefyd dros ymchwilio ADCG ymysg oedolion. Tra bo astudiaethau ar yr anhwylder ymysg plant yn pwysleisio effaith symptomau ADCG ar ymaddasiad ymysg plant, ac yn benodol ar berfformiad yn yr ysgol a chysylltiadau â chyfoedion, ychydig yn unig o astudiaethau hyd yma sydd wedi archwilio prosesau cyffelyb ymysg oedolion. Bwriad yr astudiaeth yw archwilio a fydd lefelau uwch o symptomau ADCG yn gysylltiedig â phroblemau mwy difrifol wrth ymaddasu i fywyd prifysgol.

Beth yw manteision cymryd rhan yn yr ymchwil?

Er gwaethaf cydnabyddiaeth gynyddol fod ADCG yn parhau i oedolaeth, hyd yma, ychydig yn unig o ymchwil a fu yn y maes hwn. Wrth gymryd rhan yn yr ymchwil hwn, byddwch yn cynorthwyo i hyrwyddo dealltwriaeth wyddonol o'r effaith y gallai symptomau ADCG ei chael ar allu unigolion i ymaddasu i fywyd prifysgol o ran tair agwedd: hunan-barch, cysylltiadau rhyngpersonol, a pherfformiad academaidd.

A oes raid imi gymryd rhan?

Eich penderfyniad chi fydd p'un a ydych am gymryd rhan neu beidio. Os penderfynwch gymryd rhan, mae gennych hawl o hyd i dynnu'n ôl ar unrhyw adeg heb roi rheswm.

Beth fydd yn digwydd os cymerwch ran yn yr ymchwil?

Byddwn yn ymdrin ag unrhyw geisiadau am fwy o wybodaeth neu gwestiynau ynglŷn â'r ymchwil mor effeithiol ag sydd bosibl. Yna, gofynnir ichi llenwi'r ffurflen gydsynio ar-lein, a phecyn o holiaduron sydd wedi'i e-bostio atoch. Bydd yr holiaduron yn cymryd rhyw 15-20 munud i'w llenwi. Bydd cysylltiad â phecyn holiaduron yr astudiaeth hefyd ar gael ar SONA. Gofynnir hefyd ichi anfon un o'r holiaduron ymlaen at ffrind agos fel y gall ef / hi eu llenwi amdanoch chi. Hoffem hefyd gael caniatâd gennych i edrych ar eich canlyniadau yn arholiadau Semestrau un a dau. Gyda'ch caniatâd, byddem yn casglu, o gronfa ddata'r Ysgol Seicoleg ar arholiadau, sgôr yn dynodi eich perfformiad cyfartalog mewn arholiadau. Bydd yr holl wybodaeth a gesglir yn ystod yr astudiaeth yn ddi-enw. Canfyddiadau cyffredinol a geir yng nghanlyniadau'r astudiaeth, ac nid gwybodaeth am unigolion. Bydd yr holl gyfranogwyr yn derbyn crynodeb o'r astudiaeth yng Ngorffennaf 2005. Gan mai trwy e-bost y cynhelir yr astudiaeth hon, nid ydym yn gofyn ichi roi cydsyniad trwy lofnod. Yn hytrach, os rhowch eich rhif adnabod myfyriwr inni, byddwn yn meddwl am hwnnw fel arwydd yn lle eich lofnod.

Beth a wnaef yn awr?

Os penderfynwch gymryd rhan, llenwch y ffurflen gydsynio a dechreuwch ateb y cwestiynau.

Mwy o fanylion

Os ydych am gysylltu â'r ymchwilydd ynglŷn â'r ymchwil, dyma'r manylion:

Kelly Taylor, Seicolegydd Clinigol dan Hyfforddiant James Birchwood,
Myfyriwr PhD
E-bost: kellytaylordodd@aol.com E-bost: psp00e@bangor.ac.uk

Os oes gennych unrhyw gŵynion ynglŷn â'r modd y gwneir yr ymchwil hon, mae croeso ichi gyfeirio unrhyw bryderon a fo gennych nad ydynt wedi'u datrys at

Yr Athro Fergus Lowe,
Pennaeth yr Ysgol Seicoleg,
Prifysgol Cymru, Bangor,
Bangor,
Gwynedd
LL57 2AS

Ffurflen Gydsynio

Teitl yr Astudiaeth

Dylanwadau Symptomau Anhwylder Diffyg Canolbwyntio a Gorfywiogrwydd (ADCG) ymysg Oedolion ar Ymaddasu i Fywyd Prifysgol.

Ymchwilydd / Ymchwilwyr

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Dewiswch yr ymateb priodol:

1. Rwyf wedi darllen a deall y llythyr gwybodaeth ar gyfer yr astudiaeth hon

✓ x

2. Deallaf fy mod yn cyfranogi o'm gwirfodd, a bod gennyf hawl i dynnu'n ôl ar unrhyw adeg heb roi unrhyw reswm.

✓ x

3. Cytunaf i gymryd rhan yn yr astudiaeth hon

✓ x

4. Cydsyniaf i'r Ysgol Seicoleg ryddhau cyfanswm fy ngraddfeydd academiaidd i dîm yr ymchwil eu defnyddio yn yr astudiaeth hon.

✓ x

5. Cytunaf i anfon yr Holiadur ar Ymaddasu at ffrind agos, fel y gall ef / hi ateb rhai cwestiynau amdanaf i.

✓ x

6. Cytunaf i roi fy enw a'm Rhif Defnyddiwr er mwyn derbyn credydau argraffydd CWTS.

✓ x

7. Byddwn yn fodlon i rywun gysylltu â mi ynglŷn â chymryd rhan mewn astudiaeth niwroseicolegol yn y dyfodol.

✓ x

Rhif PSU

Rhif Adnabod Myfyriwr

Y rhif ar ddalen clawr blaen eich aseiniad

Yr uchod i'w lenwi gan y prif gyfranogwyr

Gwybodaeth i gyfranogwyr eilaidd

Mae'r sawl a anfonodd y ddogfen hon atoch wedi cytuno i gymryd rhan yn yr astudiaeth ymchwil isod. Gofynnir ichi lenwi holiadur byr ar yr unigolyn hwnnw / honno, am ei b/fod wedi'ch enwebu chi fel ffrind sy'n ei (h)adnabod yn dda.

Atebwch y cwestiynau yng nghyswllt y sawl a anfonodd yr holiadur hwn ymlaen atoch, **ac nid o'ch rhan chi eich hun.**

Teitl yr Astudiaeth

Dylanwadau Symptomau Anhwylder Diffyg Canolbwyntio a Gorfywiogrwydd (ADCG) ymysg Oedolion ar Ymaddasu i Fywyd Prifysgol.

Beth yw diben yr astudiaeth hon?

Bwriad yr astudiaeth yw archwilio a fydd lefelau uwch o symptomau ADCG yn gysylltiedig â phroblemau mwy difrifol wrth ymaddasu i fywyd prifysgol. Tra bo astudiaethau ar yr anhwylder ymysg plant yn pwysleisio effaith symptomau ADCG ar ymaddasiad ymysg plant, ac yn benodol ar berfformiad yn yr ysgol a chysylltiadau â chyfoedion, ychydig yn unig o astudiaethau hyd yma sydd wedi archwilio prosesau cyffelyb ymysg oedolion. Gobeithir y bydd y wybodaeth a gesglir o'r astudiaeth hon yn hyrwyddo gwybodaeth wyddonol ynglŷn ag ADCG ymysg oedolion.

Os ydych yn fodlon llenwi'r holiadur hwn, rhowch ✓ yn y blychau cydsynio isod.

1. Rwyf wedi darllen a deall y llythyr gwybodaeth ar gyfer yr astudiaeth hon

✓ x

2. Deallaf fy mod yn cyfranogi o'm gwirfodd, a bod gennyf hawl i dynnu'n ôl ar unrhyw adeg heb roi unrhyw reswm.

✓ x

3. Cytunaf i gymryd rhan yn yr astudiaeth hon.

✓ x

APPENDIX C
RESEARCH QUESTIONNAIRES

Adult ADHD Rating Scale (AARS)

Tick the response which best describes your behaviour over the past six months

0 = Rarely

2 = Often

1 = Sometimes

3 = Very Often

- | | | | | | | | | |
|--|---|--------------------------|---|--------------------------|---|--------------------------|---|--------------------------|
| 1) Fail to give close attention to details or make careless mistakes at work. | 0 | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> |
| 2) Fidget with hands, feet or squirm in my seat. | 0 | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> |
| 3) Difficulty in sustaining my attention in tasks or fun activities. | 0 | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> |
| 4) Leave my seat in situations in which seating is required. | 0 | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> |
| 5) Don't listen when spoken to directly. | 0 | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> |
| 6) Feel restless. | 0 | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> |
| 7) Don't follow through on instructions and fail to finish work. | 0 | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> |
| 8) Have difficulty engaging in leisure. | 0 | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> |
| 9) Have difficulty organising tasks and activities. | 0 | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> |
| 10) Feel "on the go" or driven by a motor. | 0 | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> |
| 11) Avoid, dislike or reluctant to engage in work that requires sustained mental activity. | 0 | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> |
| 12) Talk excessively. | 0 | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> |
| 13) Lose things necessary for tasks or activities | 0 | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> |
| 14) Blurt out answers before questions have been completed. | 0 | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> |
| 15) Easily distracted. | 0 | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> |
| 16) Have difficulty waiting my turn. | 0 | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> |
| 17) Forgetful in daily activities. | 0 | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> |
| 18) Interrupt or intrude on others. | 0 | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> |

The Aggression Questionnaire (AQ)

Please answer the following questions according to this scale

1 = Extremely uncharacteristic of me **2 = Moderately uncharacteristic of me**
3 = Slightly uncharacteristic of me **4 = Slightly characteristic of me**
5 = Moderately characteristic of me **6 = Extremely characteristic of me**

1) Given enough provocation I may hit another person

1 2 3 4 5 6

2) There are people that push me so far that we come to blows

1 2 3 4 5 6

3) I have threatened people I know

1 2 3 4 5 6

4) I often find myself disagreeing with people

1 2 3 4 5 6

5) I can't help getting into arguments when people disagree with me

1 2 3 4 5 6

6) My friends say that I am somewhat argumentative

1 2 3 4 5 6

7) I flare up quickly but get over it quickly

1 2 3 4 5 6

8) Sometimes I fly off the handle for no good reason

1 2 3 4 5 6

9) I have trouble controlling my temper

1 2 3 4 5 6

10) At times I feel I have gotten a raw deal out of life

1 2 3 4 5 6

11) Other people always seem to get the breaks

1 2 3 4 5 6

12) I wonder why sometimes I feel so bitter about things

1 2 3 4 5 6

The Hospital Anxiety and Depression Scale (HADS)

For these questions, tick the reply that comes closest to how you have been feeling in the past week.

1) I feel tense or 'wound up'.

Most of the time	<input type="checkbox"/>
A lot of the time	<input type="checkbox"/>
From time to time, occasionally	<input type="checkbox"/>
Not at all	<input type="checkbox"/>

2) I still enjoy the things I used to enjoy

Definitely as much	<input type="checkbox"/>
Not quite so much	<input type="checkbox"/>
Only a little	<input type="checkbox"/>
Hardly at all	<input type="checkbox"/>

3) I get a sort of frightened feeling as if something awful is about to happen

Very definitely and quite badly	<input type="checkbox"/>
Yes, but not too badly	<input type="checkbox"/>
A little but it doesn't worry me	<input type="checkbox"/>
Not at all	<input type="checkbox"/>

4) I can laugh and see the funny side of things

As much as I always could	<input type="checkbox"/>
Not quite so much now	<input type="checkbox"/>
Definitely not so much now	<input type="checkbox"/>
Not at all	<input type="checkbox"/>

5) Worrying thoughts go through my mind

A great deal of the time	<input type="checkbox"/>
A lot of the time	<input type="checkbox"/>
From time to time, but not too often	<input type="checkbox"/>
Only occasionally	<input type="checkbox"/>

6) I feel cheerful

Not at all	<input type="checkbox"/>
Not often	<input type="checkbox"/>
Sometimes	<input type="checkbox"/>
Most of the time	<input type="checkbox"/>

7) I can sit at ease and feel relaxed

- Definitely
- Usually
- Not often
- Not at all

8) I feel as if I am slowed down

- Nearly all the time
- Very often
- Sometimes
- Not at all

9) I get a sort of frightened feeling like butterflies in the stomach

- Not at all
- Occasionally
- Quite often
- Very often

10) I have lost interest in my appearance

- Definitely
- I don't take as much care as I should
- I may not take quite as much care
- I take just as much care as ever

11) I feel restless as if I have to be on the move

- Very much indeed
- Quite a lot
- Not very much
- Not at all

12) I look forward with enjoyment to things

- As much as ever I did
- Rather less than I used to
- Definitely less than I used to
- Hardly at all

13) I get sudden feelings of panic

- Very often indeed
- Quite often
- Not very often
- Not at all

14) I can enjoy a good book or radio or TV programme.

- Often
- Sometimes
- Not often
- Very seldom

Wender Utah Rating Scale (WURS)

For these questions, please tick the box that most closely describes your behaviour as a child:

As a child I was (or had):

1	2	3	4	5	
Not at all or slightly	Mildly	Moderately	Quite a bit	Very much	
1. Concentration problems, easily distracted	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
2. Anxious, worrying	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
3. Nervous, fidgety	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
4. Inattentive, daydreaming	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
5. Hot or short temper, low boiling point	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
6. Temper outbursts, tantrums	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
7. Trouble with not following things through	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
8. Stubborn, strong-willed	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
9. Sad or blue, depressed, unhappy	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
10. Disobedient with parents, rebellious,	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
11. Low opinion of myself	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
12. Irritable	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
13. Moody, have ups and downs	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
14. Feel angry	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
15. Acting without thinking, impulsive	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
16. Tend to be immature	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
17. Feel guilty, regretful	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
18. Lose control of myself	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
19. Tend to be or act irrational	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

20. Unpopular with other children, didn't keep friends for long, didn't get along with other children 1 2 3 4 5

21. Trouble seeing things from someone else's point of view 1 2 3 4 5

22. Trouble with authorities, trouble with school 1 2 3 4 5

23. Overall a poor student, slow learner 1 2 3 4 5

24. Trouble with maths or numbers 1 2 3 4 5

25. Did not achieve up to my potential 1 2 3 4 5

Interpersonal Competence Questionnaire (ICQ)

Please indicate by selecting the number that best corresponds to how competent and comfortable you feel in the following interpersonal situations.

1= I am poor at this

2= I am only fair at this

3= I am ok at this

4= I am good at this

5= I am extremely good at this

1. Asking or suggesting to someone new that you get together and do something, e.g., go out together.

1 2 3 4 5

2. Finding and suggesting things to do with new people whom you find interesting and attractive.

1 2 3 4 5

3. Carrying conversations with someone new whom you think you might like to get to know.

1 2 3 4 5

4. Being an interesting and enjoyable person to be with when first getting to know people.

1 2 3 4 5

5. Introducing yourself to someone you might like to get to know.

1 2 3 4 5

6. Calling (on the phone) a new acquaintance to set up a time to get together and do something.

1 2 3 4 5

7. Presenting good first impressions to people you might like to become friends with.

1 2 3 4 5

8. Going to parties or gatherings where you don't know people well in order to start up new relationships.

1 2 3 4 5

- 1= I am poor at this**
2= I am only fair at this
3= I am ok at this
4= I am good at this
5= I am extremely good at this

9. Helping a close companion work through his or her thoughts and feelings about a major life decision, e.g. a career choice.

1 2 3 4 5

10. Being able to patiently and sensitively listen to a companion 'let off steam' about outside problems s/he is having.

1 2 3 4 5

11. Helping a close companion get to the heart of a problem s/he is experiencing.

1 2 3 4 5

12. Helping a close companion cope with family or roommate problems.

1 2 3 4 5

13. Being a good and sensitive listener for a companion who is upset.

1 2 3 4 5

14. Being able to say and do things to support a close companion when s/he is feeling down.

1 2 3 4 5

15. Being able to show genuine empathetic concern even when a companion's problem is uninteresting to you.

1 2 3 4 5

16. When a close companion needs help and support, being able to give advice in ways that are well received.

1 2 3 4 5

17. Being able to admit that you might be wrong when a disagreement with a close companion begins to build into a serious fight.

1 2 3 4 5

- 1= I am poor at this**
- 2= I am only fair at this**
- 3= I am ok at this**
- 4= I am good at this**
- 5= I am extremely good at this**

18. Being able to put begrudging (resentful) feelings aside when having a fight with a close companion.

1 2 3 4 5

19. When having a conflict with a close companion, really listening to his or her complaints and trying not to 'read' his/her mind.

1 2 3 4 5

20. Being able to take a companion's perspective in a fight and really understand his or her point of view.

1 2 3 4 5

21. Refraining from saying things that might cause a disagreement to build into a big fight.

1 2 3 4 5

22. Being able to work through a specific problem with a companion without resorting to global accusations ('you always do that').

1 2 3 4 5

23. When angry with a companion, being able to accept that s/he has a valid point of view even if you don't agree with that view.

1 2 3 4 5

24. Not exploding at a close companion (even when it is justified) in order to avoid a damaging conflict.

1 2 3 4 5

Rosenberg Self-Esteem Scale (RSE)

Here is a list of statements dealing with your general feelings about yourself. If you agree with the statement, select A. if you strongly agree select SA. If you disagree select D. If you strongly disagree select SD.

Thank you.

	Strongly agree	Agree	Disagree	Strongly disagree
1. On the whole, I am satisfied with myself.	SA <input type="checkbox"/>	A <input type="checkbox"/>	D <input type="checkbox"/>	SD <input type="checkbox"/>
2. At times I am no good at all.	SA <input type="checkbox"/>	A <input type="checkbox"/>	D <input type="checkbox"/>	SD <input type="checkbox"/>
3. I feel that I have a number of good qualities.	SA <input type="checkbox"/>	A <input type="checkbox"/>	D <input type="checkbox"/>	SD <input type="checkbox"/>
4. I am able to do things as well as most other people.	SA <input type="checkbox"/>	A <input type="checkbox"/>	D <input type="checkbox"/>	SD <input type="checkbox"/>
5. I feel I do not have much to be proud of.	SA <input type="checkbox"/>	A <input type="checkbox"/>	D <input type="checkbox"/>	SD <input type="checkbox"/>
6. I certainly feel useless at times.	SA <input type="checkbox"/>	A <input type="checkbox"/>	D <input type="checkbox"/>	SD <input type="checkbox"/>
7. I feel that I'm a person of worth, at least on an equal plane with others.	SA <input type="checkbox"/>	A <input type="checkbox"/>	D <input type="checkbox"/>	SD <input type="checkbox"/>
8. I wish I could have more respect for myself.	SA <input type="checkbox"/>	A <input type="checkbox"/>	D <input type="checkbox"/>	SD <input type="checkbox"/>
9. All in all, I am inclined to feel that I am a failure.	SA <input type="checkbox"/>	A <input type="checkbox"/>	D <input type="checkbox"/>	SD <input type="checkbox"/>
10. I take a positive attitude towards myself.	SA <input type="checkbox"/>	A <input type="checkbox"/>	D <input type="checkbox"/>	SD <input type="checkbox"/>

Sociometric Measure of Peer status

Please nominate 10 people in your class that you **Like Most** and 10 people in your class that you **Like Least** by filling in the names below in the appropriate columns. Please note that this information will be strictly confidential however you do not have to complete this list if you don't want to.

Like Most

Like Least

APPENDIX D

SCHOOL OF PSYCHOLOGY ETHICS APPROVAL LETTER

Ysgol Seicoleg
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Dear Colleagues

**The influence of Adult Attention Deficit Hyperactivity Disorder (ADHD)
Symptoms on adjustment to university**

Your research proposal (referred to above and on the attached sheet) has been reviewed by the School of Psychology Research Ethics Committee and they are satisfied that the research proposed accords with the relevant ethical guidelines. This approval is subject to amendments listed on the attached sheet being dealt with prior to your study taking place.

If you wish to make any substantial modifications to the research project, please inform the committee in writing before proceeding. Please also inform the committee as soon as possible if participants experience any unanticipated harm as a result of taking part in your research, or if any adverse reactions are reported in subsequent literature using the same technique elsewhere.

Good luck with your research.

A handwritten signature in black ink that reads 'Kath Chitty'.

Kath Chitty
Coordinator -School of Psychology Research Ethics Committee

SECTION TWO: LITERATURE REVIEW

Running head: ADHD IN ADULTHOOD

Attention Deficit Hyperactivity Disorder and Adult Functioning

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Abstract

Attention Deficit Hyperactivity Disorder (ADHD) is defined by developmentally inappropriate levels of inattention, and or hyperactivity and impulsive behaviours that emerge in early childhood and result in cross-situational impairment. Historically conceptualised as a disorder of childhood, ADHD is increasingly recognised as a chronic debilitating condition that persists into adulthood and is frequently associated with significant cognitive, educational and interpersonal difficulties.

This document reviews the evidence supporting the conceptualisation of ADHD as a valid clinical entity in adulthood. In addition the limited research evidence examining the impact of continuing ADHD symptoms upon adult functioning will be reviewed.

This review of the available literature concludes that despite the growing recognition that ADHD is a prevalent, lifelong and profoundly impairing condition it remains an under diagnosed and under treated adult psychiatric disorder.

Keywords: adult, attention deficit hyperactivity disorder, functional impairment.

Introduction

Attention deficit hyperactivity disorder (ADHD) is one of the most frequently diagnosed conditions of childhood, with an estimated prevalence ranging from 2% to 7% of the population (Barkley, Fischer, Newby, & Breen, 1988; American Psychiatric Association, 1994). ADHD is considered to be a developmental, neurobiological condition defined by the presence of severe and pervasive symptoms of inattention, over activity and impulsivity (Barkley et al. 1998; American Psychiatric Association, 1994). The condition emerges prior to the age of seven and causes functional impairment across multiple settings. DSM-IV (American Psychiatric Association, 1994) subtypes the disorder into 3 categories: ADHD combined type with symptoms of inattention and hyperactivity; ADHD predominantly inattentive type without hyperactivity; and ADHD predominantly hyperactive without inattention.

Historically ADHD has been conceptualised as a condition limited to childhood (Hill & Schoener, 1996; Lahey et al., 1998). However contrary to the prevailing view that ADHD disappears in adulthood, prospective, longitudinal follow-up studies support the idea that ADHD is a chronic, debilitating, lifelong disorder. Estimates of the number of childhood cases continuing to meet full ADHD criteria in adulthood vary widely from between 4% to 75% (Barkley, 1998; Biederman, Mick, & Faraone, 2000; Wender, 1995; Wilens, Biederman, & Spencer, 2002).

Based on their recent study, Barkley, Fischer, Smallish, and Fletcher (2002) contend that such variation in estimates can partially be explained by studies using different definitions of the disorder, length of follow-up, and source of the symptom reporting and suggest previous studies may therefore have underestimated the persistence of the condition into adulthood. In addition Young (2004) cautions that adult ADHD

may be under diagnosed as a consequence of diagnostic thresholds for childhood ADHD being too rigidly applied. Evidence from longitudinal studies suggests that activity levels are likely to decrease with age, concentration is likely to improve somewhat but impulsivity may remain as a core residual feature of the disorder (Fischer, Barkley, Fletcher, & Smallish, 1993; Young, Channon & Toone, 2001). A longitudinal study of boys with ADHD conducted by Biederman et al. (2000) showed that by age nineteen, 38% of the children met the full diagnostic criteria for ADHD, 72% retained at least one of the symptoms for diagnosis however 90% experienced clinically significant levels of impairment. Diagnostic thresholds may therefore need to be revised when applied to adults in order to take account of the developmental course of ADHD and therefore prevent under diagnosis of ADHD in adulthood (Young, 2004). Taking into account the fact that ADHD symptoms reduce as a function of time, Barkley and Murphy (1998) proposed a revision of the DSM-IV diagnostic scoring criteria for adult ADHD. Based on Barkley and Murphy's (1998) revised scoring an adult is considered to meet diagnostic criteria for ADHD inattentive type if he or she has significant difficulty with five out of nine symptoms of inattention, and for ADHD hyperactive impulsive type if they have five out of nine symptoms of hyperactivity/ impulsivity.

There is a general acceptance that the defining characteristics of ADHD, inattention, hyperactivity and impulsivity, found in childhood, are mirrored in adult ADHD.

Surveys of college students (Heligenstein, Conyers, Berns, Miller, & Smith, 1998), adults (Murphy & Barkley, 1996a), as well as studies of referred adults (Biederman et al., 1993) have all documented the occurrence of core features of ADHD in adult populations. In addition, as in childhood, adult ADHD is associated with significant

impairments in cognitive, psychiatric, interpersonal and vocational functioning (Biederman et al., 1993; Weiss & Murray, 2003). Evidence from a substantial number of studies is accumulating to support ADHD as a valid clinical entity in adulthood.

Genetics

Family and twin studies have contributed to the emerging body of research that supports the diagnostic continuity of ADHD in adulthood, through their findings of high rates of childhood onset ADHD in the parents of children with ADHD (Faraone & Biederman, 1994). Increased risk for ADHD among parents, siblings, cousins, aunts and uncles has been reported in a number of studies indicating the familiarity of the disorder (Faraone & Doyle, 2000). However in comparison to the numerous family studies of ADHD in childhood, there have been only two family studies of adult ADHD. In their study, Manshadi, Lippman, O'Daniel & Blackman, (1983), found 41% of siblings of ADHD adult participants were diagnosed with ADHD, in comparison, no siblings of the control participants had a diagnosis of ADHD. Consistent with this, Biederman et al's. (1995) study reported an elevated prevalence of 57% of ADHD among children of ADHD adults suggesting a high familial loading of adult ADHD. The familiarity of the disorder has been clearly illustrated in a prospective study by Biederman et al. (1996) of 140 boys with ADHD and 120 non-ADHD boys. By adolescence, ADHD had persisted in 85% of the ADHD boys. The prevalence of ADHD was found to be markedly higher among parents of boys with persistent ADHD compared to boys where the disorder had remitted. This has also been found to be the case in siblings of persistent ADHD probands (Faraone, Biederman, & Monuteaux, 2000). Research into the molecular genetic features of ADHD has proved valuable in contributing evidence to support the validity of the

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neuropsychological impairments, reviews on the neuropsychological performance of children with ADHD generally converge on the opinion that ADHD is strongly associated with neuropsychological deficits in attention, executive functioning and motoric inhibition (Barkley, Grodzinsky, & Dupaul, 1992; Pennington & Ozonoff, 1996).

Barkley et al. (1992) offered a unifying theory that conceptualises ADHD as a disorder characterised by executive dysfunction and deficient inhibitory control.

Executive functions refer to a class of high level cognitive control processes including abilities like reasoning, planning, set shifting, abstraction, working memory and components of attention. Intact executive functioning is considered to be essential for complex human behaviour whereas behavioural and psychiatric impairment is thought to implicate executive dysfunction (Goldberg & Seidman, 1991).

Deficits in executive function have consistently been associated with ADHD in children and adolescents (Faraone, Biederman, Spence, et al., 2000; Sonuga-Barke, Daley, Thompson, & Swanson, 2003). For example children and adolescents with ADHD display poor planning and organisation skills, impaired working memory (Mariani & Barkley, 1997), deficient attentional and strategic flexibility (Hughes, White, Sharpen, & Dunn, et al, 2000), and an inability to effectively monitor and self regulate behaviour (Biederman et al., 1993). ADHD has also been associated with impaired performance on tasks assessing verbal learning, vigilance and motoric inhibition (Faraone, Biederman, Spence, et al., 2000).

Studies investigating the neuropsychology of ADHD in adult populations have only recently emerged. To date what they appear to demonstrate is that adults with ADHD

exhibit the same distinct pattern of neuropsychological impairments that have been consistently reported in the child ADHD literature (Seidman, Biederman, Weber, Hatch & Faraone, 1998; Woods, Lovejoy, & Ball, 2002).

Comorbidity

Clinical and epidemiological studies have shown that a range of comorbid disorders frequently occur in childhood ADHD, including, conduct, antisocial, mood and anxiety disorders (Biederman, Newcorn, & Sprich, 1991; Cantwell, 1996). High levels of psychiatric comorbidity seen in childhood ADHD have also been documented in adults with ADHD (Biederman et al., 1993; Shekim, Asarnow, Hess, Zaucha, & Wheeler, 1990). In adulthood ADHD is also significantly associated with alcohol and substance misuse particularly when comorbid with antisocial behaviour patterns (Biederman et al., 1993). Faraone, Biederman, Spence, et al. (2000) discussed the possibility that ADHD in childhood may merely reflect attention deficits that are common symptoms of other valid psychiatric disorders which are later diagnosed in adulthood e.g. personality disorders, anxiety, mood and substance misuse disorders. Faraone, Biederman, Spence, et al. (2000) contend that if this were the case then childhood ADHD may be the precursor to other psychopathology in adulthood not ADHD.

Evidence against this view comes from a number of sources, in the study by Biederman et al. (1993), 23% of adults with ADHD who met full criteria for ADHD in childhood had no other psychiatric disorder. Although some disorders commonly co-occur with ADHD they are not considered to result in ADHD (Faraone,

Biederman, Spence, et al., 2000). For example Alpert et al. (1996) found that out of 116 adults with depression only 12% met the criteria for ADHD.

Response to Medication

Not only do clinically referred adults with ADHD display the same symptom profile and associated impairments as their childhood counterparts, (Biederman, et al., 1993), they also demonstrate a similar response to pharmacological treatments (Wilens et al., 1999; Satchev & Troller, 2000), thus providing further support to the diagnostic continuity between childhood and adulthood ADHD.

Despite the emerging body of evidence supporting the value of diagnosing ADHD in adulthood, the validity of such a diagnosis continues to be called into question.

Concerns about the diagnostic continuity have centred upon a number of arguments including claims made following a meta- analysis conducted by Hill and Schoener (1996) that remission rates are high for ADHD with symptoms declining sharply over time, and prevalence rates approaching zero in adulthood. However Biederman, Faraone, Monuteaux, Bober, & Cadogen, (2004) argue that Hill and Schoener's (1996) claims that ADHD disappears in adulthood are limited as their analysis focused on studies emphasising DSM-II hyperkinetic disorder rather than symptoms of inattention. The possibility remains that Hill and Scheoner (1996) overestimated remission rates due to focusing on symptoms that show the greatest improvement with age. In addition their meta-analysis only included studies that defined persistent ADHD as participants meeting full diagnostic criteria, thus excluding individuals who experience lower levels of symptoms even if they still experience ongoing impairment (Biederman, Faraone, et al., 2004).

A second line of argument against the validity of adult ADHD is the different gender ratio seen between child and adult ADHD. In contrast to childhood samples where the reported ratio of male to female participants with ADHD ranges from 2:1 in the general population (McGee & Feehan) and 9:1 in clinic samples (Klien & Manuzza, 1991), there appears to be a more balanced gender distribution in adults with ADHD (Biederman, 1993,1994). Rather than supporting an argument that a more balanced gender distribution in adult ADHD reflects false positive female cases in adult ADHD samples, Biederman, Mick, et al. (2002) offer an alternative explanation that proposes young females with ADHD are underrepresented in child samples. Biederman et al. (2002) systematically examined the influence of gender on the clinical features of ADHD in a clinic sample of boys and girls with ADHD and a non-ADHD comparison group. They found that in both boys and girls the combined type of ADHD was the predominant type; however girls with ADHD were twice as likely as boys with ADHD to display the predominately inattentive type of the condition. Biederman, Mick, et al. (2002) argued that in girls the higher rate of symptoms of inattention in comparison to the more obvious symptoms of hyperactivity and impulsivity, in conjunction to the lower rates of comorbid disruptive behaviours which tend to drive clinic referrals, may partly explain the considerably higher ratio of boys to girls in children clinically referred with ADHD. The more balanced gender representation seen in adult ADHD populations might be expected given adult cases tend to self-refer (Biederman, Faraone, et al., 2004). It has been suggested that as a consequence of ADHD symptomatology being more persistent and more impairing over time for females (Gaub & Carlson, 1997), female adults are more likely than men to seek treatment for ADHD and this may influence the gender distribution seen in adult ADHD.

Adult ADHD and functioning

The phenomenon of ADHD has been extensively explored in children and adolescence and the outcome for children with ADHD has received considerable attention, in part this has been due to the negative developmental consequences resulting from the condition. It has been consistently documented that children with ADHD are at increased risk of psychiatric comorbidity, cognitive impairments, disrupted interpersonal relationships and academic under achievement (Biederman et al., 1993; Faraone, Biederman, Spence, et al., 2000). Interest in the outcome of children with ADHD has also been driven by the recognition that the condition has wider societal implications in terms of utilisation of health care, for example a limited literature examining the association between unintentional injuries and childhood ADHD suggest that children with ADHD are more likely to sustain an unintentional injury than their non-ADHD peers (Barkley, 1998; Discala, Lescohier, & Barthel, 1998; Schwebel et al., 2004). Furthermore Swensen et al's (2004) study reported that ADHD was a significant predictor of having an accident claim and that patient costs for adults with ADHD were much greater than non ADHD adult controls. In terms of education, adults with a childhood ADHD have an educational history marked by poor academic performance, are more often expelled and complete less years of education than non-disabled peers (Biederman et al., 1993; Klein & Manuzza, 1991; Murphy & Barkley, 1996a) and yet the NIH consensus report on ADHD cautioned that 'national public school expenditure on behalf of students with ADHD may have exceeded \$3 billion in 1995' (NIH Consensus Development Panel, 2000). In addition a substantial minority of children with ADHD later become known to the criminal justice system (Manuzza et al., 1991), and studies from the USA and Sweden advise

that 25% of prison inmates meet ADHD diagnostic criteria (Dalteg, Lindgren, & Lavender, 1999; Eyestone & Howell, 1994).

However despite increasing recognition that a significant proportion of children diagnosed with ADHD continue to experience ADHD symptoms in adulthood, adult ADHD to date has not received the research attention it deserves, and little is known about the impact of ADHD on adult functioning (Young, Toone & Tyson, 2003).

Impact of Adult ADHD on Psychological Wellbeing

As previously stated, in childhood ADHD frequently co-occurs with other psychiatric disorders (Biederman, et al., 1991), and adults with ADHD have been found to have similar patterns of comorbidity to those found in child ADHD cases. Comorbidity rates as high as 77% have been found in adult ADHD with other psychiatric disorders (Biederman et al., 1993). Consideration will now turn to how ADHD in adulthood impacts upon an individual's psychological functioning.

Anxiety

Biederman et al. (1993) reported findings from a large sample of clinically referred adults with ADHD indicating the lifetime prevalence of anxiety disorders was greater than 50%. Of this sample 52% met the criteria for at least two major anxiety disorders. The co-occurrence of anxiety with ADHD is likely to exacerbate an individual's inattention, deficits in working memory, tolerance to stress and ability to cope with the demands of everyday living (Weiss, Hechtman & Weiss, 1999).

Given that anxiety is known to be associated with high vulnerability to stress and poor coping, (Vollrath & Torgersen, 2000) when anxiety is comorbid with ADHD individuals may be at greater risk for experiencing daily life events as stressful and challenging. Whilst some adults may find compensatory strategies for the cognitive deficits associated with ADHD that may then enable them to function sufficiently, many continue to subjectively experience a high degree of impairment in the ability to adequately cope with the tasks of everyday living (Weiss et al, 1999).

Depression

Studies examining the rates of comorbid depression report ranges from chance to over 70% (Young, 2000). For example Biederman et al. (1993) study of adults with ADHD found that 31% met the criteria for major depressive disorder. Individuals may be at increased risk for depression due to early life experiences characterised by poor peer relationships, social exclusion, rejection and failure (Weiss et al., 1999). Individuals with ADHD may also be less able to tolerate frustration and tend to respond catastrophically in difficult situations. Negotiating major life transitions or indeed daily life events that are challenging may emphasise the lack of requisite skills the ADHD individual has to successfully manage given situations, such realisation may increase the risk of depression (Weiss et al., 1999).

In addition Weiss, Hechtman Milroy and Perlman (1985) found that more suicide attempts were made by adults with ADHD. This may be understood in terms of a depressed individual's inability to inhibit impulsive behavioural responses to suicidal ideation. The presence of depression with ADHD may therefore indicate an increased risk for greater psychiatric morbidity (Young, 2000).

Bipolar disorder

Whilst elevated rates of ADHD have consistently been reported in children and adolescence with bipolar disorder (BPD) (Geller et al., 2000; Wozniak et al., 1995) the relationship between ADHD and BPD in adulthood is less clear. Existing data indicates that there is a link between early onset BPD and childhood ADHD and as many as 20% of all BPD adults have been found to meet the criteria for ADHD (Sachs, Baldassano, Trueman & Guille, 2000; Winokur, Coryell, Endicott & Akisal, 1993). Compared with controls, adults with ADHD have been found to have an increased risk of BPD (Millstein, Wilens, Biederman & Spencer, 1997) however the adult literature on the co-occurrence of ADHD and BPD is limited and questions remain regarding whether adults with ADHD and BPD really have two disorders that are clinically distinguishable. In a recent study Wilens et al. (2003) investigated the clinical presentation of adults with and without BPD referred to clinical trials of ADHD. The findings of the study showed adults with ADHD and BPD had prototypic symptom profiles of both clinical disorders. Results also indicated a preponderance of the combined types of ADHD with BPD compared to ADHD without BPD and consistent with the paediatric literature (Wozniak, et al., 1995) where BPD is present, a greater number of ADHD symptoms are evidenced leading to marked impaired global functioning.

In contrast to the numerous studies documenting high rates of anxiety and depression in adults with ADHD (Biederman et al., 1994; Biederman et al., 2004; Shekim et al., 1990) longitudinal prospective studies (Manuzza, et al., 1991) have not reported that children with ADHD are at increased risk for mood or anxiety disorders in adulthood. However Young (2000) questions whether comprehensive assessments for the

presence of mood and anxiety disorders were made in follow-up studies, many of which commenced without the benefit of current knowledge regarding the extent of comorbidity of ADHD with other disorders, Young suggests that the true level of ADHD comorbidity with mood and anxiety disorders has been underrepresented in these follow-up studies. Weiss et al. (1999) contend that many adults with ADHD who do not meet the criteria for a diagnosable affective disorder might nonetheless carry an emotional burden generated by the social and psychological sequelae of ADHD.

Antisocial personality disorder (APD)

In contrast to affective disorders such as depression and anxiety, which tend to have less predictive value for personality disorder in later life, prospective studies suggest that disruptive disorders in childhood including oppositional defiant disorder (ODD), conduct disorder (CD), and ADHD are important predictors of personality disorders in adulthood (Berstein, Cohen, Skodol, Bezirgianian, & Brooke, 1996; Rey, Morris-Yates, Singh, Andrews, & Steward, 1995).

Prospective studies have independently and consistently demonstrated that children with ADHD are at increased risk for developing antisocial personality disorder (APD) in adulthood (Young 2000). In a controlled longitudinal study evaluating ADHD children and non-ADHD children at an average age of 25 years, Weiss et al. (1985) found that APD was the only DSM-III diagnosis that was significantly more common in the ADHD group than controls (23% versus 2%).

Mannuzza, Klien, Bessler, Malloy, & LaPadula, (1993) conducted a prospective study investigating the adult outcome of a cohort of boys with ADHD. At 23-30 years 18% met DSM-III criteria for APD compared with 2% of non-ADHD controls. The finding that at adult follow-up, compared to controls the ADHD group were almost ten times more likely to have APD is remarkable. Questions have been raised as to whether CD in childhood can account for APD in adults with ADHD. This possibility has been challenged from a number of sources.

In the longitudinal, prospective, follow-up study by Mannuzza et al. (1993), children were excluded if they presented with disruptive behaviour patterns. In addition behavioural rating scales recorded an absence of antisocial behaviour in the sample; taken together Mannuzza et al. (1993), suggest the increased prevalence of APD in their adult sample could not be attributed to comorbid CD in childhood. In an epidemiological study of boys, Taylor, Chadwick, Hepinstall, & Dankkaerts, (1996) independently controlled for childhood CD using a four group design (ADHD, CD, comorbid ADHD/CD and normal controls). They reported that even after controlling for the co-existence of conduct problems, ADHD in childhood predicted poor social adjustment in adolescence including peer relationship problems, violence and other antisocial behaviours.

The findings of a recent study by Simonoff et al. (2004) investigating the long-term contribution of childhood characteristics such as ADHD and CD on the development of APD, adds to the current literature by demonstrating that both ADHD and CD are independent and equally strong predictors of the development of APD. The findings of the study held ADHD and CD to be risk factors for APD in early adulthood and determined that they remain long term risk factors for adult APD into middle

adulthood. More positively, the results from Mannuzza, et al. (1993) study showed that the prevalence of APD during adolescence into young adulthood fell from 25% to 15 %, Mannuzza, et al. (1993) suggests this indicates that for a small but significant minority of individuals with ADHD who exhibited APD at 18 years, APD had remitted by adult follow-up.

Substance use disorders

Numerous studies document that where childhood onset ADHD persists into adulthood, individuals are at increased risk of psychoactive substance use disorders (SUD) compared to non-ADHD controls (Mannuzza, et al 1993; 1998). This finding has attracted much clinical and research attention, due to the negative personal, and public health consequences associated with substance misuse. However this claim is not without controversy as research findings regarding SUD in adulthood are inconsistent (Mannuzza & Klein, 2000).

Biederman et al. (1997) prospective study, reported results from a 4 year follow-up of 104 children and adolescence with ADHD and 120 normal controls (mean age 15 years). No meaningful differences were found between ADHD individuals and control individuals in rates of alcohol or psychoactive substance use (15% in both groups). These findings appear to concur with similar data reported in the literature regarding ADHD in adolescence and the prevalence of SUD (Weiss, Hechtman, Perlman, Hopkins, Wener, 1979).

However a different picture emerged when the prevalence of SUD in adults with ADHD was evaluated. Biederman and colleagues (1995) retrospective study of 120

referred adults with ADHD and non-ADHD comparison adults, investigated the association between adult ADHD and SUD. In marked contrast to the previous adolescent study, much greater rates of SUD were reported in adults with ADHD (52%), compared to controls (27%). Between the groups no significant differences were found between alcohol abuse without drug abuse (20% versus 18%). However significantly greater rates of drug abuse (14% versus 5%) and drug abuse plus alcohol abuse (27% versus 6%) were reported for ADHD participants compared to non-ADHD controls.

These research findings are consistent with results of adult outcome studies of ADHD that have documented prevalence rates of SUD in adults with ADHD (Wilens, Biederman, Spence, & Francis, 1994; Murphy & Barkley, 1995; Biederman et al., 2004). For example Mannuzza et al. (1993) observed significantly higher prevalence rates of SUD in ADHD probands compared to controls, (16% versus 4%), a finding replicated in their later study (Mannuzza et al., 1998).

In line with epidemiological data (Kessler et al., 1994), and in keeping with their previous findings (Biederman et al., 1993), Biederman et al. (1995) study found alcohol abuse was more prevalent than psychoactive substance abuse, nonetheless the ADHD probands were at twice as high a risk for drug abuse and alcohol abuse than comparison controls. Biederman et al. (1995) concluded that similar levels of risks exist for adolescents' with and without ADHD, however given the inflated risk for SUD in adults with ADHD, a rapid increase in SUD is expected in ADHD children during the transition from adolescence into adulthood. Conversely, other studies have failed to find significant differences between ADHD and normal controls in reference

to SUD (Barkley, Murphy & Kwasnik, 1996a; Weiss and Hetchman, 1993; Weiss et al, 1985).

A considerable literature base demonstrates that APD is highly associated with SUD in adult ADHD (Biederman et al., 1995; Manuzza et al., 1993). The lack of detection of SUD in adults with ADHD in the above studies appears a somewhat unexpected finding given that each one of these studies reported higher levels of APD in adults with ADHD in comparison to normal controls (Mannuzza & Klein, 2000).

The presence of co-occurring APD in adults with ADHD has typically been used to account for the increased risk of SUD in this population however, research is now emerging that suggests ADHD itself confers an increased risk for SUD independent of comorbid APD. For example Biederman et al. (1995) found as high as 40% of adults with ADHD had a life time diagnosis of SUD independent of other psychiatric comorbidity.

Although studies have consistently found that the persistence of ADHD in adulthood is significantly associated with high risk for substance misuse (Biederman et al., 1993; 1995; Mannuzza et al., 1991), the reasons for this increased risk remain open to question. Biederman et al. (1995) suggested that such findings may reflect a self medication hypothesis (Khantzian, 1985). This hypothesis contends that some individuals attempt to use psychoactive substances as a form of self medication, in this case to attenuate the core symptoms of ADHD and its associated impairments e.g. low self-esteem, and interpersonal relationship problems (Manuzza & Klein, 2000; Wilens, 2004; Young et al., 2003). Although some case reports have described the use psychoactive substances to ameliorate ADHD symptoms (Kaminer, 1992, Milin, Loh,

& Wilson, 1994), interpretation of the relationship between substance abuse and ADHD is complex and more research is needed to understand the nature of the risk for SUD for adults with ADHD.

Questions have also been raised concerning whether exposure to pharmacotherapy for children with ADHD increases the risk for SUD (Goldman, Genel, Bezman & Slantez, 1998). Wilens, Faraone Biederman and Gunawardene (2003) conducted a meta-analysis of all long term studies of children, adolescence and adults with ADHD to examine the putative association between previous pharmacotherapy and subsequent SUD. Results from their meta-analysis demonstrated that early pharmacotherapy for the treatment of ADHD significantly reduces the risk for later SUD. Furthermore detailed examination of the individual studies evidenced the protective effects of stimulant medication for ADHD on adverse SUD outcome. In a longitudinal follow-up study of boys referred with ADHD Biederman, Wilens, Mick, Spencer and Farone (1999) report that untreated ADHD significantly increases the risk for SUD even after allowing for comorbid CD. Biederman et al. (1999) argue that the significant associations found between ADHD and SUD in their study of adults with ADHD (Biederman et al., 1995) reflected the lack of early diagnosis and treatment of the disorder in these adults, thus implying that the absence of pharmacotherapy may increase the risk for SUD in individuals with ADHD.

Too summarise extant literature indicates that comparable with the paediatric literature, ADHD in adulthood has been found to exert a negative influence upon an individuals psychological wellbeing. High rates of additional comorbid developmental disorders, including elimination, tic and language disorders

(Biederman, et al., 2004) and other forms of psychopathology have been extensively reported in adults with ADHD.

Functional impairments in specific life domains

The nature of adult functioning can not entirely be understood by extrapolating information from the paediatric literature, as ADHD impacts upon adult functioning across life domains that are not typically experienced by children or adolescence. The domain of parenting has been identified as a case in point (Weiss, Hechtman, & Weiss, 2000).

Parenting

It is reasonable to suppose that the core clinical features of ADHD would impede parental functioning. Arnold, O'Leary, and Edwards (1997) contend that parenting styles defined by inconsistency, reactivity and lack of thought regarding the parenting role are likely to develop when parents experience symptoms of impulsivity, inattention and over activity. The quality of care experienced by children with ADHD parents may also be compromised by the difficulties parents have in planning and organising routine care activities and tasks of daily living caused by problems associated with executive dysfunction (Sonuga-Barke, Daley, & Thompson, 2002). Furthermore, Sonuga-Barke et al. (2002) suggest that adult ADHD negatively effects parenting competence, and may reduce a parent's sense of efficacy and diminish their self-esteem, consequently the presence of persistent ADHD symptoms in the parent may create a more chaotic, unstable family environment (Beiderman, Faraone & Monuteaux, 2002).

In two recently completed studies Psychogiou, Daley, Thompson & Sonuga-Barke (Submitted) evaluated the impact of maternal ADHD on parental style and competence. This research was specifically interested in the interaction between child and maternal ADHD symptoms and its impact on parenting behaviour. The studies yielded remarkably similar patterns of findings that suggested both maternal and child ADHD symptoms equally and independently increase the probability of negative parental practices. Data did not however support the hypothesis that maternal and child ADHD acted cumulatively to increase negative parenting risk. Moreover Psychogiou et al. (Submitted) reported finding an interaction among maternal and child ADHD symptoms whereby high levels of maternal ADHD moderated the negative influence high levels of child ADHD had on parenting behaviour.

Replicating previous research, parental ADHD in the main was found to have a negative effect on parenting style; however results suggested parenting of ADHD children was less affected when mothers had ADHD. It appeared maternal ADHD served to 'protect' the ADHD child from the risk of negative parenting, possibly by eliciting empathetic parental responding (Psychogiou et al. Submitted)

Research and clinical observations have suggested that parental ADHD may serve as a barrier to the effective treatment of childhood ADHD (Evans, Vallano, & Pelman, 1994; Weiss et al., 2000). Sonuga-Barke et al. (2002) suggest that parental ADHD is likely to negatively impact treatment adherence across a range of treatment formats including pharmacotherapy (Stein, 1994), however Sonuga-Barke et al. argue that parental ADHD may have the greatest impact upon parent training interventions for treating children with ADHD.

Sonuga-Barke et al. (2002) assessed the impact of maternal ADHD on the efficacy of an empirically supported parent training intervention for a community sample of preschoolers with ADHD symptom profiles. Results suggested that high levels of maternal ADHD, independent of other aspects of maternal functioning, compromised the degree of improvement in the child's condition.

From clinical observations Weiss et al. (2000) concluded that the features of ADHD are likely to interfere with a parent's ability to engage in parent training programmes and will consequently influence the effectiveness of the parent training interventions for childhood ADHD. These included (1) difficulty listening and complying with instructions; (2) reduced adherence to treatment protocols; (3) tendencies to opt for quick fix treatments as opposed to following current treatment regimes; (4) displaying disruptive, disorganised behaviour particularly in group situations; (5) difficulties implementing behavioural reward systems consistently; and finally (6) have more difficulty establishing a therapeutic relationship with the therapist.

Research evidence appears unequivocal in concluding that ADHD has a profound influence of on adult functioning in the domain of parenting. Addressing parental ADHD appears of critical importance, not only for effective treatment of childhood ADHD but for reducing conflict and increasing stability of the family as a whole system.

Driving

Until relatively recently the impact ADHD has upon an individuals driving ability has been an area of functional impairment neglected in the ADHD literature. Barkley (2004) argues that driving is an important domain of adult functioning firstly because

it facilitates many other areas of adaptive functioning including employment, social opportunities and independence. Secondly driving potentially increases exposure to injury to oneself, others and can damage property.

In the light of early longitudinal evaluations of ADHD children in adulthood, that found, as adult drivers these individuals were more likely to be involved in traffic accidents than peers without the disorder (Weiss, Hechtman, Perlman Hopkins & Wener, 1979; Weiss & Hechtman, 1993), a number of studies were undertaken to further investigate the adverse driving outcomes associated with ADHD.

Barkley, Guevremont, Anastopoulos, Dupaul, and Shelton (1993) conducted a 3-5 year follow-up driving survey of clinic referred adolescents with ADHD and a community comparison control group. Based on parental reports, the survey found compared with non-ADHD peers, ADHD adolescents were: more likely to have driven a car illegally prior to having a license, unlikely to be using good driving habits, more likely to have had licences suspended or revoked, likely to have had traffic citations particularly for speeding and were almost four times more likely to have an accident whilst driving.

Nada-Raja et al. (1997) describe results of an epidemiological study of the association between ADHD symptoms in adolescence of both genders and driving related difficulties. This study found that elevated rates of ADHD symptomatology were strongly correlated with driving offences and accidents. Similar patterns of adverse driving outcomes have also been documented in older samples of adults with ADHD who self-reported on their driving histories (Barkley et al., 1996b; Murphy & Barkley, 1996b; Woodward, Fergusson, & Horwood, 2000).

Despite the mounting evidence that ADHD is reliably associated with significantly greater risk for numerous adverse driving outcomes, much of the available research utilised small sample sizes and relied heavily on self-report rather than official driving records. In addition research has largely neglected to examine the contribution comorbid disorders made to poor driving outcomes and most importantly the processes through which ADHD impairs driving ability has not been investigated.

To address the short comings of previous research Barkley, Murphy, DuPaul and Bush (2002), conducted the most comprehensive large scale evaluation of driving ability in adults with ADHD to date. The study compared 105 adults with ADHD (aged 17 to 28) to 64 non-ADHD adults on multiple levels of driving ability and on tasks of executive function. Unlike most of the prior studies Barkley et al. (2002) corroborated self-reported driving histories with official Department of Motor Vehicle (DMV) driving records.

Based on Michion (1979), Barkley's study conceptualised driving as having multiple, hierarchical components, and evaluated cognitive abilities associated with each component level. This included fundamental cognitive abilities required for driving a vehicle, (Level I: basic cognitive) for example, attention, concentration, visual discrimination, speed of processing and reaction and rule following. Level II: operational abilities which included skills related to the tactile management of the vehicle, assessed using a driving simulator. Level III: strategic driving ability involves planning and decision making behaviours this was assessed using a videotape test of driving knowledge. Participants, and others with knowledge of the participant's

driving performance, reported on actual driving behaviour (Level IV). Adverse driving outcomes were assessed through self-report and via official driving records.

Replicating earlier research Barkley et al. (2002) found, individuals with ADHD experienced more accidents, incurred more speeding citations and had more licence suspensions than control participants with equivalent driving experience. The self-reported group differences of driving offences and accidents, with the exception of vehicle crashes were also confirmed through official DMV records. Furthermore, Barkley et al. (2002) extended previous research by examining the neuropsychological basis for the higher frequency of driving risks in ADHD drivers. In comparison to the control group, the ADHD group showed greater deficits in basic cognitive abilities related to driving. On the continuous performance test (CPT), compared to controls, the ADHD group demonstrated considerable difficulties with attending to the task and made substantially more errors when the task instructions were reversed, indicating problems with rule governed behaviour. The results support the continuance of cognitive deficits associated with the disorder in childhood (Barkley, 1998), into young adulthood and provides an indication as to the underlying mechanisms that may predispose adults with ADHD towards more driving accidents.

Given that ADHD has consistently been associated with impaired executive functioning (Barkley, 1997); it is not entirely unexpected that the ADHD group in this study manifested deficits in some executive functions including working memory, vigilance, response inhibition and interference control. The study demonstrated a significant but modest relationship between laboratory measures of response

inhibition and accidents while poor interference control was correlated with the number driving citations.

Previous research findings have been unclear as to whether driving problems can be fully explained by ADHD symptoms as opposed to other comorbid disorders.

However, through conducting post hoc analyses Barkley et al. (2002) demonstrated that the group differences found in the study were the consequence of ADHD rather than other comorbid disorders or the sex or intelligence level of the participant.

Research findings to date provide convincing evidence that adult drivers with ADHD are at substantially increased risk for numerous negative driving outcomes.

It would seem therefore that driving is potentially an important area of functional impairment for the majority of adults with ADHD.

Antisocial and criminal behaviours.

Whilst a plethora of follow-up studies on the adolescent outcome of ADHD children have consistently demonstrated an association between childhood ADHD and elevated rates of antisocial behaviour or conduct disorder in adolescence (Barkley, et al., 1990; Klein & Manuzza, 1991), few studies exist that have followed ADHD children into adulthood. Of these studies, most have reported high rates of antisocial personality disorder in adults who had ADHD as children (Hechtman, Weiss, & Perlman, 1984; Manuzza et al., 1993; Loney, Whaley-Klahn, & Conboy, 1983), however the risks for antisocial and criminal behaviour in adulthood is less certain (Barkley, Fischer, Smallish, & Fletcher, 2004).

Mannuzza, Klein, Konig, and Giampino, (1989) compared official arrest records for 103 ADHD male probands with a mean age of 18 years and 100 normal control participants with the same mean age. Findings indicated that significantly more ADHD than control participants had been arrested (39% versus 20%), convicted (28% versus 11%) and imprisoned (9% versus 1%). Moreover significantly more ADHD probands had been charged with aggressive offences (18% versus 7%) and multiple felonies (12% versus 3%) (Manuzza & Klein, 2000). At adult follow-up (mean age 26 years), 98% of the participants in the above study were interviewed and although arrest and imprisonment rates were not reported at the adult follow-up, five ADHD probands were imprisoned for crimes involving aggressive acts (Mannuzza et al., 1993).

Although high employment rates at the point of adult follow-up suggested low arrest and imprisonment for this sample, arrest and imprisonment during previous 8 year follow-up period can not be discounted (Satterfield & Schell, 1997).

Satterfield, Hoppe and Schell (1982) reported a prospective evaluation of 110 adolescent males with childhood ADHD and 89 normal controls. The study obtained official records of arrest from the age of ten to eighteen years for both groups. Records revealed significantly higher arrest rates for ADHD juveniles (36% to 58% versus 2% to 11%), and higher rates of incarceration (25% versus 1%) than controls.

Satterfield & Schell (1997) replicated these findings in a later study of the adult outcome of participants in their earlier adolescent follow-up study. Arrest rates for adults with ADHD were inflated compared to controls (21% versus 1%). Satterfield & Schell (1997) concluded that ADHD in childhood increased the risk for criminal

behaviour in both adolescence and adulthood. Furthermore, the arrest history in ADHD boys during adolescence was a good predictor of arrest in adulthood.

In an earlier study Hechtman, Weiss and Perlman (1984) reported a 10 year prospective study of 75 participants who had childhood ADHD and 44 normal controls both groups were between 17 and 24 years. However the findings of this study appear discrepant with other studies. Here there were no significant group differences in the frequency or seriousness of reported offences in the preceding five years. During the previous five years compared to controls ADHD participants did report more court referrals (47% versus 32%) but this did not hold for the year preceding follow-up. In a subsequent study Weiss and Hechtman (1986) reported a 15 year follow-up of 63 ADHD participants and 41 controls who were an average of 25 years. In keeping with their earlier study, compared to controls more ADHD participants appeared in court during the 3 years prior to follow-up (18% versus 5%) however these offences were mainly for speeding. Only a minority of ADHD participants were involved with criminal offences such as theft, drug possession or drug dealing.

A number of explanations have been proposed to account for the disparity in results across studies. Weiss and Hechtman (1993) suggest that sociocultural differences between the geographical locations of each study (Montreal follow-up study conducted by Weiss & Hechtman, 1993; the New York study by Mannuzza et al., 1993 and the Los Angeles study by Satterfield & Schell 1997), may contribute to the inconsistent findings. In addition, the studies utilised different methodologies for example, official arrest records (New York and Los Angeles studies) compared to

interviews (Montreal study), there were also different attrition rates between studies (28% in the Montreal study and 0% New York and Los Angeles studies) and these factors may in part account for the different rates of antisocial and criminal behaviour found in each study.

Barkley et al. (2004) provide another major study evaluating the self-reported frequency of antisocial activities and substance use by young adults (mean age 20-21 years), from a large sample of clinically diagnosed ADHD children (N=147) and community controls (N=73). Results indicated that by adulthood a greater proportion of adults with ADHD compared to controls had engaged in antisocial activities including stealing property or money, disorderly conduct, arson, assault, carrying a concealed weapon and running away from home. Consistent with findings from previous studies greater numbers of the ADHD adults compared to controls had been arrested at least once 54% versus 37%, and 27% versus 11%, more than 3 times. Official arrest records corroborated self-reported group differences.

The ADHD adult group also committed a higher frequency of a variety of criminal offences than comparison controls. Furthermore Barkley et al. (2004) extended previous findings by demonstrating group differences in drug related antisocial activities. That is, ADHD in childhood, and adolescence predicted higher frequency of drug related antisocial behaviours in adulthood.

Research suggests that adults with ADHD are at increased risk for engaging in a range of antisocial and criminal activities and such a risk has both clinical and public health implications.

Conclusions

ADHD was originally conceptualised as a disorder of childhood that consisted of developmentally inappropriate levels of inattention, hyperactive and impulsive behaviours that caused cross situational impairment (American Psychiatric Association, 1994). A substantial amount of research exists on ADHD in childhood (Barkley, 1998) however research examining ADHD in adulthood is still in its infancy. Despite this, evidence from studies of clinical correlates, neurobiological investigations, family studies, and treatment response provide support for the validity of diagnosing ADHD in adulthood (Faraone, biederman, Spence, et al., 2000).

Research provides compelling evidence that ADHD is associated with negative developmental outcomes in childhood, however the developmental course and outcome of ADHD in adulthood is less clearly understood (Willoughby, 2003).

Notwithstanding there is an emerging body of research demonstrating that ADHD is a lifelong disorder that that is associated with profound impairment across a number of domains of functioning (Weiss & Murray, 2003).

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APPENDIX G
SUBMISSION GUIDELINES
CLINICAL PSYCHOLOGY REVIEW



Clinical Psychology Review

Guide for Authors

SUBMISSION REQUIREMENTS: All manuscripts should be submitted to Alan S. Bellack, Department of Psychiatry, The University of Maryland at Baltimore, 737 W. Lombard St., Suite 551, Baltimore, MD 21201, USA. Submit three (3) high-quality copies of the entire manuscript; the original is not required. Allow ample margins and type double-space throughout. Papers should not exceed 50 pages (including references). One of the paper's authors should enclose a letter to the Editor, requesting review and possible publication; the letter must also state that the manuscript has not been previously published and has not been submitted elsewhere. One author's address (as well as any upcoming address change), telephone and FAX numbers, and E-mail address (if available) should be included; this individual will receive all correspondence from the Editor and Publisher.

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TITLE PAGE: The title page should list (1) the article; (2) the authors' names and affiliations at the time the work was conducted; (3) a concise running title; and (4) an unnumbered footnote giving an address for reprint requests and acknowledgements.

ABSTRACT: An abstract should be submitted that does not exceed 200 words in length. This should be typed on a separate page following the title page.

KEYWORDS: Authors should include up to six keywords with their article. Keywords should be selected from the APA list of index descriptors, unless otherwise agreed with the Editor.

STYLE AND REFERENCES: Manuscripts should be carefully prepared using the *Publication Manual of the American Psychological Association*, 5th ed., 1994, for style. The reference section must be double spaced, and all works cited must be listed. Avoid abbreviations of journal titles and incomplete information.

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For Books: Barlow, D.H., Hayes S.C., & Nelson, R.O. (1984). *The scientist practitioner: Research and accountability in clinical and educational settings*. Elmsford, NY: Pergamon.

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SECTION THREE: RESEARCH PAPER

Running head: ATTENTION DEFICIT HYPERACTIVITY DISORDER AND
ADJUSTMENT TO UNIVERSITY

The Influence of Adult Attention Deficit Hyperactivity Disorder (ADHD)

Symptoms on Adjustment to University

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Abstract

Attention Deficit Hyperactivity Disorder (ADHD) is now recognised as a life long disorder which for many is associated with profound impairment in educational and interpersonal functioning. To date little is known about the impact of ADHD on adult functioning at times of major life transitions. This study examined the influence of ADHD symptoms on young adults' adjustment to university across three domains: academic achievement, self-esteem and interpersonal competence.

Results confirmed that higher levels of ADHD symptoms were associated with poorer academic achievement but not with lower self-esteem or difficulties with interpersonal functioning. Study limitations, directions for future research and implications for interventions for adult students with ADHD symptoms are discussed.

Introduction

Attention deficit hyperactivity disorder (ADHD) is among the most commonly diagnosed childhood psychological disorders with an estimated prevalence of 2%-7% (Barkley, Fischer, Newby, & Breen, 1988). The disorder is characterised by developmentally inappropriate degrees of inattention, over activity and impulsive behaviours that result in impairment across situations (American Psychiatric Association, 1994). ADHD was originally conceptualised as a disorder of childhood however evidence from longitudinal follow-up studies of adults with a childhood diagnosis emphasise the diagnostic continuity of ADHD into adulthood (Barkley, Fischer, Smallish & Fletcher, 2002; Manuzza, Klein, Bessler, Malloy & LaPadula, 1998; Weiss & Hetchman, 1993). ADHD is increasingly recognised as a lifelong condition associated with impairment in multiple life domains (Weiss & Murray, 2003). Estimates of the prevalence of children with ADHD who meet the full ADHD criteria in adulthood vary widely from 4% to 75% (Hetchman, 1992; Klein & Manuzza, 1991, Weiss & Hetchman, 1986; Wilens, Biederman, & Spencer, 2002). Barkley et al. (2002) argue that such variation may be explained by differences in sources of symptom reporting and operational definitions of ADHD and caution that follow-up studies may have underestimated the persistence of the condition into adulthood.

Existing research indicates that children who display early ADHD symptom profiles are at increased risk for a range of negative developmental outcomes in adolescence and adulthood. These include continued impairment from the core symptoms of inattention, hyperactivity and impulsive behaviour (Young, 2004), as well as

associated psychosocial difficulties such as antisocial behaviour (Simonoff et al., 2004), substance abuse (Biederman et al., 1995), interpersonal and self-esteem problems (Slomkowski, Klein & Mannuzza, 1995), psychiatric comorbidity (Young Toone & Tyson, 2003) and impairment in academic and occupational functioning (Manuzza & Klein, 2000; Young, 2000).

The phenomena of ADHD has been extensively examined in childhood and early to mid adolescence, however the literature regarding the long term outcome of adults with a childhood diagnosis of ADHD is greatly lacking (Barkley et al., 2002; Friedman et al., 2003). There are only a few studies to date that have examined the adult outcome of children with ADHD (Loney, Whaley-Klahan, Kosier, & Conboy, 1983; Manuzza et al., 1998; Rasmussen & Gillberg, 2001; Taylor, Chadwick, Hepinstall, & Danckaerts, 1996; Weiss & Hechtman, 1993). Such studies have principally reported educational, occupational and mental health status of adults with a childhood diagnosis of ADHD (Klein & Manuzza, 1991). These long term follow-up studies have demonstrated the negative influence that ADHD symptoms have upon the above areas of functioning. However few studies have actually examined the impact of ADHD symptoms on the developmental transitions faced by adolescents and young adults. In view of the evidence that ADHD is associated with functional impairment in a number of important areas, it seems imperative that future research considers how ADHD symptoms might influence an individual's ability to deal with challenges arising from critical life transitions.

Adjustment to University

During the last two decades more research attention has been directed to the adjustment difficulties encountered by students in university (Shaver, Furnham & Buhrmester, 1986; Riggio, Watring & Throckmorton, 1993). Early research concerning the variables which may influence psychosocial adjustment to university tended to focus on background variables such as age (Hull, 1978) and nationality (Chataway & Berry, 1989), and more recently personality variables (Halamandaris & Power, 1999). However to date there have been no studies that have specifically examined the impact of ADHD symptoms on adjustment to university life.

Moving to university to undertake a course of academic study represents a major point of transition and change in the lives of young adults. (Manuzza, Klein, Bessler, Malloy & LaPadula, 1993). The transition to university may present considerable challenges to young adults. For many they may be facing the first major separation from parents and family most certainly they will have to deal with changes in their friendship networks and adapt to the demands of creating new social relationships. (Larose, Bernier, Tarabulsky, 2005).

In addition to adjusting to a new social environment the transition to university demands that individuals adjust to a new academic environment, one in which the individual must take greater responsibility than was previously expected for managing their academic progress. For example individuals are expected to self determine objectives and priorities for their studies, initiate problem solving strategies to cope with the increased academic demands and make decisions regarding their futures (Larose et al., 2005). Arguably the adjustment required to both novel academic and

social environments during the transition to university life may pose significant challenges to young adult students with ADHD symptoms.

Academic Achievement

Compromised academic achievement including attaining poorer marks, failing grades more frequently and more commonly being expelled or dropping out of school (Biederman et al., 1993; Manuzza et al., 1993) is one of the most ubiquitous risks associated with the behavioural symptoms (inattention, impulsivity and over activity) of ADHD (DuPaul et al., 2004; Frick et al., 1991). The relationship between academic underachievement and ADHD appears to be specific to ADHD related behaviours and independent of comorbid conduct problems (Gadow et al., 2002; Rapport, Scanlan, & Denny, 1999). Researchers have suggested that a number of variables are implicated in predicting academic underachievement in childhood ADHD including, symptom severity (DeShazo Barry, Lyman, & Klinger, 2002) and cognitive variables such as working memory, and attentional capacity (Rapport et al., 1999).

Emerging evidence from studies of adults with ADHD suggests that impairments in academic functioning that are associated with childhood ADHD continue throughout formal schooling and further education. Consequently adults with ADHD have academic histories that reflect academic underachievement predicted by childhood ADHD (Biederman et al., 1993; 2002; Murphy & Barkley, 1996). This includes requiring additional tutoring, attending special classes, and leaving school without qualifications (Biederman, Faraone, Monuteaux, Bober & Cadogen, 2004; Manuzza et al., 1993).

Impaired academic functioning has been a consistent finding across prospective follow-up studies of adults with a childhood diagnosis of ADHD (Weiss, Hechtman, Milroy & Pearlman, 1985; Manuzza et al., 1993, Mannuza, Klein, Bessler, Malloy, & Hynes, 1997). Results across the studies showed that adults with ADHD achieved lower grades, more frequently repeated and failed more courses, and completed on average 2.2 years less schooling when compared with the non-ADHD control participants. Furthermore only 3% of ADHD participants compared to 15% of comparison controls were registered in or had completed a graduate degree by 25 years of age (Manuzza & Klein, 2000).

Interpersonal Communication Problems

It has long been recognised that the problems of children diagnosed with ADHD are not limited to the academic domain; evidence suggests that significant impairment in the domain of social relationships is commonly experienced (Fredrick & Olmi, 1994; Barkely, 1990). Studies have demonstrated that children and adolescents with ADHD display deficits in interpersonal communication skills that are associated with impaired functioning within their peer relationships (Barkley, Murphy, & Kwasnik, 1996; Faigel, Sznajderman, Tishby, Turel & Pinus, 1995). As a consequence children and adolescents with ADHD are more likely to experience peer rejection than children with other externalising behaviour disorders or their non-disordered age related peers. It has been argued that peer rejection may result from peers finding patterns of behaviour characteristic of ADHD e.g. interrupting conversation inability to turn take and lacking awareness of the impact of their behaviour on others, intolerable (Greene et al., 1996; Hinshaw & Melnick, 1995; Weiss & Hechtman, 1993).

The limited extant research suggests that the symptoms of ADHD continue to create considerable difficulties within the interpersonal relationships in the lives of young adults with the disorder (Barkley et al., 1996; Weiss & Hechtman, 1993). Effective interpersonal communication skills are considered critical for positive psychosocial adjustment which in turn has been considered a contributory factor in academic achievement (Sharma, 1973), it therefore appears important to examine whether deficits in interpersonal communication skills persists into adulthood, subsequently predisposing adults' with ADHD to impoverished interpersonal relationships and academic underachievement (Riggio et al., 1993; Rapport, Friedman, Tzelepis, & Voorhis, 2002).

Self-esteem

Available research on the association between ADHD and lowered self-esteem is more uncertain. Until relatively recently few studies have investigated the self-perceptions of children with ADHD. Over the last decade two divergent viewpoints have begun to emerge from the literature. Some researchers have argued that children with ADHD display a 'positive illusory bias' (Taylor & Brown, 1989) in their self-perception that is, they hold overly positive perceptions despite poor academic and social functioning (Hoza et al., 2004; Gresham, Macmillan, Bocian, Ward & 1998). Other researchers contend that children with ADHD are at increased risk for low self-esteem and this risk continues in to adolescence (Slomkowski et al., 1995; Treuting & Hinshaw, 2001; Weiss & Hechtman, 1993).

Low self-esteem and impaired social functioning displayed by ADHD children in adolescence has also been found to persist into young adulthood (Slomkowski et al.,

1995; Weiss & Hechtman, 1993). In view of the mixed results from empirical work regarding the nature of self-esteem in ADHD childhood and adolescence (Hoza, et al., 2004) and its association with later outcomes in adulthood (Slomkowski et al., 1995) there is a need for more research examining the relationship between adult ADHD and self-esteem particularly in regard to implications for current adjustment and future psychological wellbeing.

The present study aimed to investigate the influence of adult ADHD symptoms on adjustment to university. Based on the findings of previous research it was predicted that higher levels of ADHD symptoms would be associated with poorer academic achievement. It was also predicted that higher levels of ADHD would be associated with lower self-esteem and poorer interpersonal functioning.

Method

Participants

First and second year undergraduate psychology students were recruited from the School of Psychology participant pool at the University of Wales Bangor.

Questionnaire packs were e-mailed to 660 psychology students, one hundred and nine questionnaire packs were returned, giving a response rate of 16.5%. The study sample consisted of 21 males and 88 females. The mean age was 19.5 years ($SD=2.470$) and ranged between 17 and 34 years.

Measures

For the purpose of this study questionnaire packs were e-mailed to first and second year undergraduate psychology students. The questionnaire pack comprised of demographic questions providing information regarding the participants age and gender and eight assessment measures. In addition, with the participant's permission, a measure of their academic achievement was obtained directly from the School of Psychology. This consisted of semester one exam and coursework results, aggregated into a percentage.

Adult ADHD Rating Scale (AARS; Barkley & Murphy, 1998).

This is a self-report measure consisting of 18 items. The measure is based on the DSM-IV criteria which assesses symptoms of inattentiveness (9 items), impulsiveness (3 items) and hyperactivity (6 items). Adults rate their own behaviour over the past 6 months on a 4 point scale (0 = rarely; 1 = sometimes; 2 = often; 3 = very often). The scale as a whole and the inattention and impulsive/overactive sub-scales within it have

good internal consistency and also predict concurrent ratings provided by spouses, parents, and cohabiting partners about the participants themselves (Edwards, Barkley, Laneri, Fletcher, & Metevia, 2001; Murphy & Barkley, 1996; Murphy & Schachar, 2000). Internal consistency was measured using Cronbach's Alpha. In this sample a high level of internal consistency was found for the AARS (Cronbach's $\alpha = .90$).

The Aggression Questionnaire, short form (AQ; Bryant & Smith 2001).

This 12 item self-report measure, based on the original 27 item scale from Buss & Perry (1992) consists of 4, 3 item factors measuring physical aggression, verbal aggression, and anger and hostility. Adults rate their own behaviour on a scale of 1 – 6 (1 = extremely uncharacteristic of me to 6 = extremely characteristic of me). Bryant & Smith (2000) report Cronbach's alpha scores ranging from 0.70 to 0.83 for factors of the AQ. Using structural equation modelling they also tested the comparability of the factors represented in the short and long forms of the AQ, and reported that shortening the AQ to 12 items did not appear to change the conceptual meaning of the underlying aggression subtraits. Internal consistency was measured using Cronbach's Alpha. Cronbach's α scores for the AQ in this sample were Physical Aggression (Cronbach's $\alpha = .86$), Verbal Aggression (Cronbach's $\alpha = .87$), Anger (Cronbach's $\alpha = .82$), and Hostility (Cronbach's $\alpha = .81$).

The Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983).

The HADS is a brief, 14 item self-report measure that assesses anxiety and depression. In a review of the HADS, Bjelland, Dahl, Haug and Neckelmann (2002) report widespread agreement on its psychometric properties. For example most factor analyses demonstrate a two factor solution, HADS anxiety and HADS depression. The

correlations between the two sub-scales vary from 0.40 to 0.74. Cronbach's alpha for HADS anxiety varied from 0.68 to 0.93 (mean 0.83) and for HADS depression from 0.67 to 0.90 (mean 0.82). Correlations between the HADS and other commonly used measures of anxiety and depression ranged from 0.49 to 0.83. Internal consistency was measured using Cronbach's Alpha. Cronbach's α for the HADS in this sample was Anxiety (Cronbach's $\alpha=.83$), Depression (Cronbach's $\alpha=.62$).

Wender Utah Rating Scale (WURS; Ward, Wender & Reimher, 1993).

The abbreviated WURS is a 25 item questionnaire designed to be used with adults to retrospectively yield estimated scores for their ADHD symptoms during childhood. Scores on the WURS correlate with retrospective reports of childhood symptoms by parents. Research has shown the measure has excellent internal consistency (alpha =0.91, Reitz-Junginger et al., 2003) and good test retest stability (Ward et al 1993). Internal consistency was measured using Cronbach's Alpha. Cronbach's α for the WURS in this sample was (Cronbach's $\alpha=.90$).

Rosenberg Self-esteem Scale (RSE; Rosenberg 1965).

This is a self administered measure consisting of a 10 item 4 point scale with response options ranging from 1 (strongly agree) to 4 (strongly disagree). The scale is a measure of global self-esteem on which respondents rate their feeling of self acceptance, and sense of being capable, worthwhile and competent. The scale has been used with a wide variety of populations. It has been shown to have acceptable levels of reliability and validity with test retest reliability of 0.85 over a two week period, and internal consistency of 0.88 in adolescent populations (Barrett, Webster & Wallis 1999).

Research has shown the scale to have a sufficient Cronbach's alpha of 0.89 in a young adult population (Langeveld, Grootenhuis, Voute, De Haan, & Van Den Bos, 2004).

Internal consistency was measured using Cronbach's Alpha. The Cronbach's α for the RSE in this sample was (Cronbach's $\alpha=.89$).

Interpersonal Competence Questionnaire (ICQ Buhrmeser, Furman, Wittenberg & Reis, 1988). This is a 40 item questionnaire designed to test social skills in 5 domains of interpersonal competence. Only 3 of the five sub-scales (24 items) were used for this study these were (a) initiating relationships, (b) emotional support and (e) interpersonal conflict. Respondents select from a 5 point rating scale ranging from 1 = 'I am poor at this' to 5 = 'I'm extremely good at this', to indicate their level of competence and comfort in handling a variety of interpersonal situations. Buhrmeser et al. (1988) report good test retest reliability and Cronbach's alpha scores ranging from .77 to .87 with a mean of .83 for the five domains of interpersonal competence. Internal consistency was measured using Cronbach's Alpha. The Cronbach's α for the three sub-scales used in this sample was (Cronbach's $\alpha=.76$).

Academic achievement

This will consist of semester one exam and coursework results, aggregated into a percentage. This measure was collected directly from the School of Psychology with the participant's permission.

Procedure

Ethical approval was sought and granted from the School of Psychology, University of Wales Bangor. Participants were recruited from the School of Psychology participant

pool at the University of Wales Bangor. All first and second year psychology students were e-mailed an information letter about the study, a consent letter and questionnaire pack. Participants who wanted to participate in the study were required to read the information letter, answer questions on the consent letter, and then complete the questionnaire pack on-line. Participants were also asked to forward one of the questionnaires (Adult ADHD Rating Scale) to a close friend for them to complete about the participant. Return of the completed consent form with the consent to participate questions ticked and the questionnaire pack was taken as informed consent to participate in the study. A link to the study questionnaire pack was also available on the School of Psychology website.

To protect the identity of participants, data was anonymised on receipt by allocating each participant a number. Only participant's numbers were entered onto the research data base. This questionnaire study also acted as the screening phase for a series of neuropsychology studies which had already been granted ethical permission.

Results

Data preparation

Exploratory data analysis was conducted to examine the distribution of the data and suitability for parametric analysis. The means were calculated and all the data was examined for outliers (outliers were set at two SD from the mean). Outliers of more than 2 standard deviations (SD) were removed; the new mean was calculated and used to replace all the outliers. A Kolmogorow-Smirnov (KS) test was performed to assess the normality of the data. A non significant result ($\alpha > 0.05$) indicates normality. Results of the KS test indicated that the following variables were parametric; these were the AARS, the WURS, the ICQ (Initiating Relationships), the ICQ (Conflict Management), the ICQ (Total score) the RSE, HADS (Anxiety), and Academic Achievement (aggregated exam and course work score) KS range $Z \geq 1.077$, $P \leq .196$. The KS test indicated that the following variables were non parametric; the AQ (Physical Aggression), AQ (Verbal Aggression), AQ (Hostility), AQ (Anger), the ICQ (Emotional Support) and the HADS (Depression) KS range $Z \geq 2.441$, $P \leq .000$.

A symptom count based on the DSM-IV criteria for ADHD was computed using AARS scores. Experiencing each symptom 'rarely or sometimes' was recoded as 0, and experiencing each symptom 'often or very often' was recoded as 1 then summed to create a total ADHD symptom count. A total score for the ICQ was created by summing the three factor scores. Z-scores were calculated for the exam and course work scores then added together to create an aggregate score for academic achievement.

Analysis strategy

1. Descriptive data was prepared to show the proportion of participants' in this sample who displayed ADHD, depression and anxiety and low self-esteem.
2. The influence of psychosocial and demographic variables on ADHD symptom scores were examined using Pearson's Product-Moment correlations for parametric data and Spearman's Rho correlations were used for non parametric data. The influence of gender was examined using a one-way Analysis of variance (ANOVA) as ANOVA is robust to violation of the non parametric assumption with moderate to large sample sizes $N \geq 15$ cases per group (Green, & Salkind 2003). Gender groups in this analysis were larger than 15.
3. Finally the linear association between ADHD symptoms and adjustment to university across three domains (academic achievement, self-esteem and interpersonal competence) was examined using linear regression which is also robust to violation of the non parametric assumption with moderate to large sample sizes (Green, & Salkind 2003).

Prevalence of Psychopathology

Table 1 and 2 display the proportion of participants in this sample who exhibited ADHD symptoms, depression and anxiety problems and low self-esteem according to standard cut offs. Based on the revised scoring criteria for ADHD proposed by Barkley and Murphy (1998), the number of participants' in this sample exhibiting ADHD symptoms were similar to their original population estimate of roughly seven percent. In this sample a sizeable number of participants also met the criteria for inattentive and hyperactive/impulsive types only. Compared with norms for levels of anxiety and depression derived from Crawford, Henry, Crombie and Taylor (2001)

participants in this sample reported no severe anxiety but compared with norm rates had greater levels of mild to moderate anxiety. Surprisingly participants in this sample did not meet clinical cut-off for depression. Estimates of levels of self-esteem in this sample (mean 28.41, SD 4.77) were similar to those found by Rosenberg (1989) (mean 34.73, SD 4.86). It was not possible to compare levels of aggression in this sample as measured by the AQ as no population based norms currently exist for the AQ however 17% of this sample scored greater than 1 SD above the mean.

[Insert Tables 1-2 here]

Association between ADHD symptoms and measures of psychosocial adjustment to university were examined using Pearson's correlation for parametric data and Spearman's Rho correlations for non parametric data. Table 3 shows moderate, significant associations between the AQ (verbal aggression, anger and hostility), the RSE, and the HADS (anxiety and depression) indicating that students with higher levels of ADHD symptoms are more likely to have lower self-esteem, experience more anger, exhibit more verbal aggression and hostile behaviours and experience greater levels of anxiety and depression. A small, marginally significant association between ADHD symptoms and ICQ (interpersonal conflict) was seen suggesting students with high levels of ADHD symptoms were less effective at managing situations of interpersonal conflict.

[Insert Table 3 here]

The influence of ADHD symptoms on academic achievement was examined using a two step multiple regression model. Other forms of psychopathology which previously had shown to be associated with ADHD symptoms (AQ verbal, AQ hostility, AQ anger, anxiety and depression) were entered into the first step of the model and ADHD symptom count was entered into the second step. The results of this analysis indicated that other forms of psychopathology were not significant predictors of academic achievement, $R^2 = 0.15$, $F(5, 57) = 2.02$, $p = .089$.

A second analysis was performed to evaluate the influence of ADHD symptoms on academic achievement after controlling for the influence of other forms of psychopathology. This model was significant $R^2_{\text{Change}} = .086$, $F(5, 57) = 6.30$, $p = .015$. The results of this analysis demonstrated that when other forms of psychopathology are controlled for ADHD symptoms remained a significant predictor of academic achievement ($\beta = -.375$, $p = .015$).

A second linear regression was also used to examine the influence of ADHD symptoms on self-esteem. Previous examination highlighted an association between self-esteem and other forms of psychopathology. To control for this a two step model was created where other forms of psychopathology were entered into the first step (AQ verbal, AQ hostility, AQ anger, anxiety and depression) and self-esteem total score was entered into the second step. Within the first step of the model results of this analysis indicated that other forms of psychopathology predicted lower self-

esteem $R^2 = .514$, $F(5, 57) = 12.05$, $p = .000$. High levels of depression ($\beta = -.255$, $p = .025$), and high levels of hostility ($\beta = -.466$, $p = .000$) predicted lower self-esteem.

Results of a second analysis showed that ADHD symptoms were not a predictor of self-esteem scores once other forms of psychopathology had been controlled $R^2_{\text{Change}} = .021$, $F(5, 57) = 2.477$, $p = .121$ ($\beta = -.183$, $p = .121$).

A third linear regression was used to evaluate the influence of ADHD symptoms on interpersonal competence. To control for previously identified associations between interpersonal competence and other forms of psychopathology a two step model was created. Other forms of psychopathology were entered into the first step (AQ verbal, AQ hostility, AQ anger, anxiety and depression), and interpersonal competence total score was entered into the second step.

Results of the analysis showed that other forms of psychopathology were significant predictors of interpersonal competence $R^2 = .226$, $F(5, 60) = 3.49$, $p = .008$.

A second analysis was performed to examine the influence of ADHD symptoms on interpersonal competence once other forms of psychopathology had been controlled. Results of this second analysis demonstrated that after controlling for other forms of psychopathology ADHD symptoms were not a significant predictor of interpersonal competence $R^2_{\text{Change}} = .036$, $F(5, 60) = 2.91$, $p = .093$.

Indicating that individuals with higher ADHD symptoms scores did not report greater interpersonal problems than individuals with lower ADHD symptom scores ($\beta = .244$, $p = .093$).

Linear regression was also used to examine the influence of retrospective accounts of ADHD symptoms (WURS total score) on academic achievement. Other forms of psychopathology which had previously had been shown to be associated with the WURS were entered into the first step of the model (AQ verbal, AQ hostility, AQ anger, anxiety and depression) and WURS total score was entered into the second step. The results of this analysis indicated that other forms of psychopathology were not predictors of academic achievement $R^2 = .120$, $F(5, 57) = 1.557$, $p = .187$.

The results of a second analysis were unable to show that higher levels of ADHD symptoms in childhood were a significant predictor of academic achievement after other forms of psychopathology had been controlled for

$R^2_{\text{Change}} = .037$, $F(5, 57) = 2.44$, $p = .124$. ($\beta = -.259$, $p = .124$).

A further linear regression was used to look at the influence of retrospective accounts of ADHD symptoms (WURS total score) on self-esteem. To control for previously identified associations between WURS and other forms of psychopathology once again a two step model was created, where other forms of psychopathology were entered into the first step (AQ verbal, AQ hostility, AQ anger, anxiety and depression) and the WURS total score into the second step. Other forms of psychopathology were found to significantly predict self-esteem scores $R^2 = .433$, $F(5, 59) = 8.994$, $p = .000$.

Within the first step two significant predictors of self-esteem existed, hostility ($\beta = -.446$, $p = .001$) and depression ($\beta = -.278$, $p = .023$) signifying students with higher levels of hostility and depression had lower self-esteem scores.

The results of a secondary analysis were unable to demonstrate any significant findings for the influence of retrospective reports of higher ADHD symptoms on self-esteem scores $R^2_{\text{Change}} = .001$, $F(5, 59) = .113$, $p = .737$ ($\beta = -.046$, $p = .737$)

A final linear regression was performed to evaluate the influence of retrospective reports of ADHD symptoms on interpersonal competence. A two step model was created where other forms of psychopathology were entered into the first step (AQ verbal, AQ hostility, AQ anger, anxiety and depression) and the WURS total score into the second step. The results of this analysis indicated that the model was significant $R^2 = .192$, $F(5, 60) = 2.852$, $p = .022$, but the different forms of psychopathology made no unique contributions to predicting levels of interpersonal competence. Secondary analysis failed to demonstrate that retrospective accounts of higher ADHD symptoms predicted interpersonal competence $R^2_{\text{Change}} = .005$, $F(5, 60) = .391$, $p = .534$ ($\beta = -.095$, $p = .534$).

Analysis of the influence of ADHD symptoms on academic achievement, self-esteem and interpersonal competence based on collateral informants report of participants ADHD symptoms could not be performed due to the poor response rate from collateral informants.

Discussion

This study sought to examine the influence of ADHD symptoms on adjustment to university across three domains: academic achievement, self-esteem and interpersonal competence. The results of this study suggested that higher levels of ADHD symptoms were associated with poorer academic achievement. This finding is consistent with previous long term follow-up studies demonstrating an association between ADHD and academic underachievement (measured in terms of aggregated exam and course work marks) in young adulthood (Biederman et al., 1993; Mannuzza et al., 1993; 1997; Weiss et al., 1985). Within this study academic achievement was influenced by concurrent ADHD symptomatology rather than retrospective reports of psychopathology.

The finding that higher levels of ADHD symptoms were not associated with lower self-esteem appear to be discrepant with previous research which found that individuals with ADHD reported significantly lower self-esteem in late adolescence and adulthood than comparison controls (Slomkowski et al., 1995; Weiss & Hechtman, 1993). Previous research shows that low self-esteem in adolescence is associated with lower levels of academic achievement in adulthood (Manuzza et al., 1993) however the levels of self-esteem reported here may reflect the fact that the individuals with ADHD symptoms in this sample have attained a higher level of academic achievement than the general population of individuals with ADHD.

Another possibility is that the results give credence to the idea that individuals with ADHD exhibit a 'positive illusory bias' in their self-perceptions (Hoza et al., 2004).

The present findings indicated that higher levels of ADHD symptoms were not a significant predictor of interpersonal competence. Within this sample individuals with more ADHD symptoms did not report difficulties in the domain of interpersonal competence. This finding is in contrast to the results of other research demonstrating that children, adolescents and adults with ADHD symptomatology display deficits in interpersonal communication skills (Biederman, Faraone & Chen, 1993; Greene et al., 1996; Weiss & Hechtman, 1993) and in the case of adults with ADHD, studies have reported adults can have an awareness of deficits in interpersonal competence when this is dependent on social rather than emotional skills (Friedman et al., 2003). However previous research has also suggested that individuals with ADHD are less aware of deficits in interpreting emotional cues displayed by others, which consequently disrupts their abilities to establish and maintain interpersonal relationships (Rapport, Friedman, Tzelepis, & VanVoorhis 2002). The lack of reported difficulties in interpersonal competence in this study may be a reflection of this finding. It is also possible that this sample due to their relatively high functioning, were indeed aware of their deficits in interpersonal functioning and that this has influenced their use of compensatory strategies.

Clinical implications

The findings of the present study suggest a number of clinical implications. The study demonstrated that there are young adults students who meet clinical cut offs for ADHD who whilst having attained a higher level of academic achievement than would be expected in the general population of individuals with ADHD (Biederman et al., 2004; Manuzza et al., 1993; 1997) nonetheless experience greater academic underachievement compared to students with lower levels of ADHD symptoms.

Educational departments seeking to support the academic progress of students with ADHD symptoms and facilitate them making the necessary adjustment to new social and academic environments encountered during the transition to university, may wish to consider interventions aimed at improving the functioning of adults with ADHD.

A number of studies have demonstrated the potential of psychosocial treatment approaches in the management of adult ADHD (Safren, et al., 2004; Stevenson, Whitmont, Bornholt, Liversey, & Stevenson, 2002; Stevenson, Stevenson, & Whitmont, 2003; Young, 1999, 2000, 2004). Psychosocial approaches aim to help individuals actively cope with core ADHD symptoms and improve everyday functioning by teaching practical management and compensatory strategies in organisation and planning skills, time management, coping with distractibility, and in using self verbalisation and memory aids (Stevenson et al., 2004). Psychosocial approaches appear to offer an effective means of reducing the negative impact of ADHD symptoms on functioning and therefore facilitate the ADHD adult in meeting the demands of adjusting to university life.

Limitations and directions for future research

The results of the present study should be considered in the light of certain methodological limitations. A major limitation of this study was the poor response rate and consequently relatively small number of participants (N=109). However it is noteworthy that despite the small sample statistical power was adequate to show modest differences between individuals with higher and lower levels of ADHD symptoms in some of the analysis. Other limitations include the lack of control for

cognitive ability and neuropsychological impairments associated with ADHD which may influence academic achievement at university (Biederman et al., 2004).

The findings of this study identified an association between adults with ADHD symptoms and academic underachievement, it did not however clarify the cause of this association in terms of a number of variables identified in previous research as potential predictors of academic underachievement such as ADHD subtype (Frick et al., 1991), symptom severity and behavioural and cognitive impairments associated with ADHD (DeShazo Barry et al., 2004; DuPaul et al., 2004). Nor was the present study able to investigate the impact of ADHD symptoms on different academic skills such as working in groups, attending lectures, planning to meeting course deadlines, and engaging in purposeful problem solving when academic problems arise.

Additional limitations include the over reliance of self-report measures of ADHD symptoms, self-esteem and interpersonal competence, although academic achievement was not measured by self-report, giving some independence of data.

Finally participants in this study were relatively high functioning, well educated adults, therefore the generalizability of the findings of the present study to the wider population of adults with ADHD may be limited.

Despite these considerations the results suggested that adults within higher education who report high levels of ADHD symptoms, experience greater academic underachievement compared with those with lower levels of symptoms. Further exploration of the research question would benefit from incorporating independent assessment of self-report measures and examining the impact of ADHD symptoms on specific academic skills. Including measures to control for the influence of cognitive ability and neuropsychological impairment on academic achievement would also

extend the results of this study. Finally the small number of participants highlights the importance of replicating the study.

Overall the findings of this study are consistent with previous research observing an association between academic underachievement and ADHD in adulthood, which may have implications for interventions aimed at enhancing the psychological, social and academic functioning of adult students with ADHD symptoms.

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APPENDIX H
RESULTS TABLES

Table 1: Showing the proportion of participants in this sample who meet the criteria for ADHD based on standard assessment measures.

ADHD Subtypes	Scoring based on DSM-IV criteria for ADHD in childhood		Scoring based on Barkley & Murphy (1998) revised scoring criteria for adults	
	Number	%	Number	%
ADHD Combined type	1	1	7	7
ADHD Inattentive type	6	6	6	6
ADHD Hyperactive/ impulsive type	4	4	10	10

Table 2: Showing the percentage of participants in this sample with anxiety and depression problems compared with non clinical UK norms derived from Crawford, Henry, Crombie & Taylor (2001).

Measure	Normal	Mild	Moderate	Severe
HADS Anxiety	53.5	27.2	19.1	0
HADS Depression	100	0	0	0
Crawford, Henry, Crombie & Taylor (2001)				
HADS Anxiety	66.8	20.6	10.0	2.6
HADS Depression	88.6	7.8	2.9	0.7

Table 3: Correlation Matrix Showing the Association between ADHD Symptoms and Measures of Psychosocial Adjustment to University

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
1.AARS	1.0														
2.AQ (Physical)	.081 (.457)	1.0													
3. AQ (Verbal)	.375** (.000)	.572** (.000)	1.0												
4. AQ (Anger)	.278** (.009)	.441** (.000)	.651** (.000)	1.0											
5. AQ (Hostility)	.374** (.000)	.238** (.018)	.300** (.003)	.349** (.000)	1.0										
6. HADS (Anxiety)	.459** (.000)	.124 (.233)	.233* (.024)	.273** (.007)	.567** (.000)	1.0									
7. HADS (Depression)	.380** (.000)	-.046 (.656)	.141 (.174)	.186 (.071)	.442** (.000)	.557** (.000)	1.0								
8.ICQ (Initiating)	-.011 (.918)	.036 (.731)	.010 (.920)	-.028 (.783)	-.184 (.073)	-.198 (.057)	-.265** (.009)	1.0							
9.ICQ (Emotional support)	-.006 (.957)	-.135 (.181)	-.066 (.518)	-.106 (.292)	-.060 (.555)	.018 (.863)	-.183 (.072)	.263** (.009)	1.0						
10.ICQ (Conflict management)	-.200 (.068)	-.423** (.000)	-.473** (.000)	-.458** (.000)	-.264* (.010)	-.021 (.843)	.026 (.803)	.053 (.610)	.374** (.000)	1.0					
11.ICQ (Total)	-.050 (.661)	.217** (.041)	-.233* (.028)	-.178 (.094)	-.313* (.003)	-.188 (.086)	-.259* (.016)	.573** (.000)	.667** (.000)	.569** (.000)	1.0				
12. RSE	-.408** (.000)	-.040 (.700)	-.034 (.749)	-.074 (.477)	-.498** (.000)	-.491** (.000)	-.489** (.000)	.191 (.068)	.252* (.014)	.180 (.087)	.283** (.009)	1.0			
13. WURS	.374** (.000)	.253* (.018)	.290** (.006)	.373** (.000)	.478** (.000)	.362** (.001)	.450** (.000)	-.259 (.015)	-.201 (.058)	-.388** (.000)	-.310** (.005)	-.388** (.000)	1.0		
14. Academic Achievement	-.159 (.151)	-.132 (.236)	.012 (.908)	.096 (.354)	-.129 (.219)	.051 (.631)	-.049 (.642)	-.026 (.802)	.081 (.433)	-.083 (.453)	-.083 (.453)	.025 (.811)	-.158 (.152)	1.0	0

Figures in bold denote Pearson's correlations

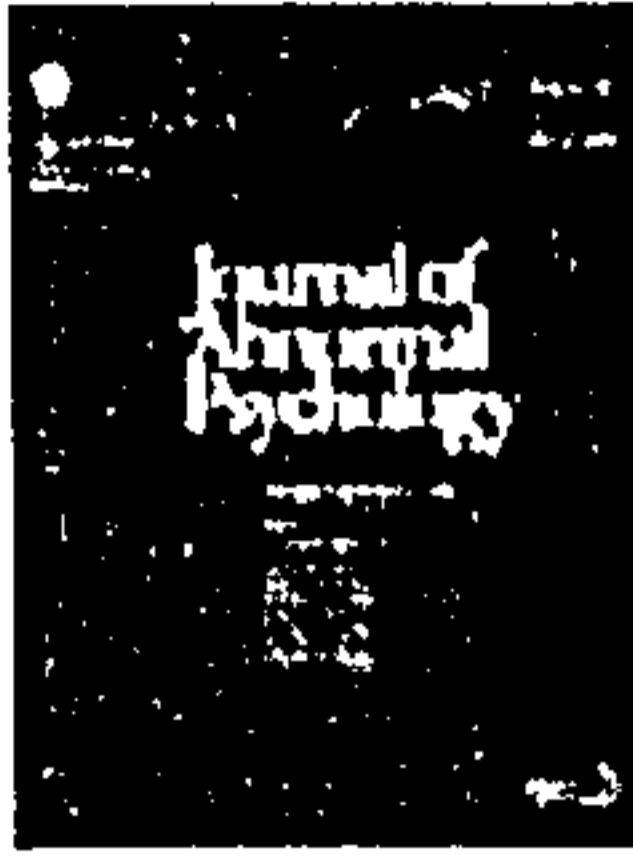
** Significant at 0.01 Level (2-tailed). * Significant at 0.05 Level (2-tailed)

APPENDIX I

SUBMISSION GUIDELINES

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**SECTION FOUR: CONTRIBUTIONS TO THEORY, CLINICAL
PRACTICE AND LEARNING**

Contributions to Theory, Clinical Practice and Learning

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Contributions to Theory, Clinical Practice and Learning

Introduction

Attention deficit hyperactivity disorder (ADHD) in childhood and early to mid-adolescence has received a great deal of research and clinical attention, however the literature regarding the long term outcome of adults with a childhood diagnosis of ADHD is greatly lacking (Barkley et al., 2002; Friedman et al., 2003). Only a handful of studies have examined the adult outcome of children with ADHD (Loney, Whaley-Klahan, Kosier, & Conboy, 1983; Manuzza, Klien, Bessler, Malloy, & LaPadula, 1998; Rasmussen & Gillberg, 2001; Taylor, Chadwick, Hepinstall, & Danckaerts, 1996; Weiss & Hechtman, 1993). To my knowledge no research has been conducted that directly investigates the impact of ADHD symptoms on adult functioning in the context of major life transitions. This study aimed to examine the influence of ADHD symptoms on young adults' adjustment to university across three domains: academic achievement, self-esteem and interpersonal competence. A more detailed consideration of the implications of this research study in terms of future research, theory development and clinical practice than could be afforded in the empirical paper will be provided here.

Implications for future research and theory development

Academic achievement

Overall the results of the present study appear consistent with findings in the paediatric literature on ADHD that documents an association between ADHD and compromised academic achievement (Biederman, Fischer, Smallish, & Fletcher, 2002; DuPaul et al., 2004; Rapport, Scalan & Denny, 1999). Academic

underachievement in the extant literature is defined by failing and repeating more grades, attaining poorer marks, more frequent expulsion from school and completing less formal education (DuPaul et al., 2004; Biederman et al., 1993; Manuzza et al., 1993). Within this study academic achievement was defined by academic scores, measured using aggregated examination and course work scores, on this basis, the results of the present study are also in keeping with findings from the few available adult outcome studies of children with ADHD that demonstrate deficits in academic achievement compared to non-ADHD peers (Manuzza et al., 1993, Mannuzza, Klien, Bessler, Malloy, & Hynes, 1997; Weiss & Hechtman, 1993). Interestingly, results indicated that individuals who reported high levels of anxiety also had higher academic achievement than those with low levels of anxiety.

The results of this study were unable to demonstrate an influence on academic achievement for retrospective reports of ADHD symptoms. These finding could be due to sampling bias, and not therefore entirely unexpected. The individuals in this sample are likely to represent the highest functioning adults with ADHD symptoms, as individuals with very high levels of ADHD are likely to be the most academically impaired and therefore least likely to attain a university level of education.

Self-esteem

Current research on the association between ADHD and lowered self-esteem is more controversial, some researchers have found that children with ADHD are at increased risk for low self-esteem (Slomkowski, Klein, & Mannuzza, 1995; Treuting & Hinshaw, 2001). Other investigators have argued that children with ADHD display a 'positive illusory bias' (Taylor & Brown, 1989) in their self-perception that is, they

hold overly positive perceptions of their functioning abilities (Hoza et al., 1993; Gresham et al., 1998).

Previous investigations have reported that children with ADHD who have experienced low self-esteem in adolescence are likely to continue to experience low self-esteem in adulthood (Slomkowski et al., 1995; Weiss & Hechtman, 1993). The results of this study were unable to demonstrate that higher levels of ADHD symptoms predicted lower levels of self-esteem in this adult sample. Alternatively research has found that individuals with elevated levels of ADHD symptoms exhibit 'positive illusory bias' in their self-perceptions despite the likelihood of having experienced academic, and social problems during childhood (Hoza, Pelman, Dobbs, Sarno Owens & Pillow, 2002; Hoza, Pelman, Milich, Pillow & McBride, 1993; Hoza, et al., 2004). It is possible that the results of the present study reflect the tendency of individuals with ADHD symptoms to engage in positive illusory thinking regarding their self-concept. It could also be that the participants with higher levels of ADHD symptoms in this study were inattentive to the social cues which may drive low self-esteem. However, it is also possible that the expectation that ADHD children will have low self-esteem largely as a consequence of the difficulties they experience in academic, social, and behavioural domains does not readily apply to the population of university students with high levels of ADHD symptoms in this sample who are by definition high academic achievers.

Interpersonal competence

Impaired social functioning has consistently been associated with ADHD in childhood and adolescence (Biederman, Faraone, & Chen, 1993; Green, et al., 1996; Barkley, Murphy, & Kwasnik, 1996), the available research suggests that difficulties in the domain of interpersonal communication skills continue into adulthood for children with ADHD (Manuzza & Klein, 2000; Weiss & Hechtman, 1993; Young, 2000) however, few studies have systematically examined this aspect of the disorder in adulthood (Rapport, Friedman, Tzelepis, & Van Voorhis, 2002). In this study, individuals with high levels of ADHD symptoms reported fewer difficulties in the domain of interpersonal competence than would have been predicted by previous research findings (Manuzza & Klein, 2000; Rapport et al., 2002). While the reasons for this discrepant finding remain unclear it is possible to speculate that the individuals in this sample who exhibited elevated levels of ADHD are sufficiently high functioning to be aware of deficits in social competence and therefore employ compensatory strategies. Alternatively results of this study could be explained in terms of previous research findings that indicate adults with ADHD often appear insensitive to their effect upon others and lack awareness of when they misinterpret the emotional responses of other, (Friedman et al., 2003; Rapport et al., 2002). It could also be argued that adults with ADHD symptoms in this sample lacked insight regarding how competent they were at managing interpersonal interactions.

Limitations of the study

The results of this study should be considered in the context of certain methodological limitations. One of the main limitations of the study was the disappointingly poor response rate which yielded a relatively small number of participants. This was

despite offering potential participants much needed printer and course credits. Recruitment was also hampered by the School of Psychology limiting the time available for Large Scale Research Projects to run. The present study was not given permission to run until week seven of semester one. In addition, encouraging students to participate was complicated by needing special permission from the chair of the student participation panel before reminders about the study could be sent to the students. It is also possible that individuals were discouraged from participating in a study via e-mail. Perhaps posting questionnaires to participants could have enhanced recruitment. Offering additional incentives to participate in research is not currently permissible to those undertaking Large Scale Research Projects within the School of Psychology however this may warrant revision given the difficulties in recruiting sufficient numbers of participants to make research viable.

The finding that higher levels of ADHD symptoms predicted poorer academic achievement should be interpreted with caution given a major limitation to the study was the lack of control for the influence of intelligence on academic performance. That said, numerous studies have demonstrated an association between ADHD and academic underachievement after controlling for the influence of intelligence (DeShazo Barry, Lyman, & Grofer Klinger, 2002; Fischer, Barkley, Edelbrock & Smallish, 1990; Rapport et al., 1999) suggesting that measures of intelligence and academic achievement are imperfectly correlated (Frick et al., 1991).

The literature to date has repeatedly documented that children and adolescents with ADHD show impairments in attention and executive functions relative to non-ADHD counterparts (Barkley, 1997; Siedman, Biederman, Monuteaux, Weber & Faraone,

2000). ADHD children and adolescent perform poorly on tasks of vigilance, sustained attention and motor inhibition and on tasks involving verbal learning and memory. They also show impaired performance on tasks involving executive functions such as reasoning and planning (Barkley, 1997; Pennington & Ozonoff, 1996). Furthermore children with ADHD who manifest deficits in executive functions show significant impairment in academic performance compared to controls (Biederman et al., 2004). Research into the neuropsychological functioning of adults with ADHD is limited; however evidence suggests that ADHD in adulthood is associated with executive dysfunction, the presence of which is associated with academic underachievement (Seidman, Biederman, Weber, Hatch & Faraone, 1998).

Given that the present research omitted neuropsychological assessment measures it is also plausible that the academic underachievement seen in individuals with more ADHD symptoms in this study could be accounted for by neuropsychological deficits rather than differences in the clinical features of ADHD (Biederman et al., 2004). Nor did this study include measures of motivation or aptitude to engage in academic pursuits that may influence academic achievement. The results of this study could be strengthened by including measure of intelligence, neuropsychological functioning, motivation and aptitude to academic study. In addition longitudinal data is needed to fully understand the association between intelligence, neuropsychological impairment and functional outcomes in adulthood.

Furthermore the study had no means of controlling for the possibility that individuals in the sample may have been receiving pharmacotherapy for ADHD which may have influenced the prevalence of symptoms and levels of impairment in functional

domains under investigation. However it is unlikely that the participants in this study would be in receipt of pharmacotherapy for ADHD as ADHD is rarely treated by adult mental health services in the United Kingdom. The lack of control for pharmacotherapy in this study could be addressed in future research by identifying and actively monitoring the use of medication for the research study period. Neither could this study control for the possibility that individuals may have been using illicit drugs, nicotine or alcohol as a form of self medication, to minimise the core symptoms of ADHD (Biederman et al., 1995; Wilens, 2004).

The results of the study confirmed some previous research, finding an association between adults with ADHD symptoms and academic underachievement; however results do not clarify the cause of this association. It is not clear whether academic underachievement is related to ADHD subtype, or the behavioural (hyperactivity and impulsivity) or cognitive impairments (i.e. executive dysfunction) associated with the disorder. Further clarifying the differential contribution of behavioural and cognitive impairments in relation to academic underachievement could extend the emerging literature on adult ADHD and guide academic interventions.

It has been argued in the paediatric literature that some academic areas such as reading and writing are more negatively impacted by ADHD behaviours than areas such as mathematics (DeShazo Barry et al., 2002; DuPaul et al., 2004). However due to ethical reasons and concerns regarding data protection it was only possible to collect information on academic grades in an aggregated form consequently academic achievement was defined as a unitary construct. It was therefore not possible to investigate the influence of ADHD symptoms on different academic skills such as

working in groups, listening to lectures, planning course work, or engaging in problem solving should difficulties in academic work arise.

This limitation could be addressed in future research by examining information across academic content and by conducting focus groups with students experiencing ADHD symptoms.

To fully explore the relationship between ADHD and self-esteem and to evaluate possible fluctuations in self-perception it would have been desirable to have collected information from more than one time point. In addition to using a global measure of self-esteem it may also have been interesting for measures of domain specific self-perception and task specific self-evaluations for example the Student Self-concept Scale (Gresham et al., 1998) to have been included.

To provide independent data for individuals ADHD status and social/interpersonal functioning, information was sought via a sociometric measure of peer status (Miller-Johnston et al., 2003) and by requesting a close friend of the participant to complete the Adult ADHD Rating Scale (Barkley & Murphy, 1998). Unfortunately the rate of return for these questionnaires was so low they could not be included in the analysis.

Ideally multiple and independent sources of information would have been collected to substantiate the validity and reliability of the self-report measures used and the conclusions drawn from the research findings. If time constraints had allowed this could have been achieved by face-to-face interviews and observations. In addition multiple self-report measures of ADHD symptoms, academic achievement, self-

esteem, and interpersonal competence could have been used to provide a more comprehensive assessment of the influence of ADHD symptoms in each functional domain.

Finally the research sample was relatively high functioning and well educated, it is possible that results may not represent the general population of adults with ADHD who attain lower levels of academic achievement than the present sample. Therefore the generalizability of the current findings to other populations of adults with ADHD may be limited. To deal with this limitation the research could be replicated using samples of non-referred adults recruited from work place environments or from adult education classes.

Implications for Clinical Practice

The findings from the present study highlight a number of clinical implications for the individual and for those seeking to understand the academic problems adults with ADHD face. A primary finding from the study was that a high prevalence of ADHD symptoms was observed in the present sample of university students. Arguably greater attention needs to be given by both health care providers and educational institutions to the provision of appropriate services for individuals experiencing ADHD in adulthood.

From an educational perspective institutions may wish to consider interventions that may support the academic progress and psychosocial adjustment to university life of students experiencing high levels of ADHD symptoms.

Weis, Hechtman and Weiss (1999) describe a number ways of helping university students identified as having high levels of ADHD symptoms to manage their disorder within an academic environment. The following recommendations are not intended to be comprehensive, as any provision of services should essentially reflect the needs of the individual however services to students with ADHD symptom profiles might include:

- psychoeducation for educational staff and university student counsellors
- courses on study skills
- academic accommodations in terms of exams and course work
- student supervisors to monitor and advise on academic progress and assist resolving psychosocial adjustment issues.

Many adults with ADHD have also been seen to benefit from mentors who can provide encouragement and advice in dealing with difficult situations (Bemporad, 2001) this may have particularly good application in the academic environment.

Stimulant medication has a well documented efficacy in the treatment of ADHD and continues to be the main stay of treatment for ADHD in both children and adults (Spencer, Biederman Wilens et al., 1996; Wilens, Spencer, & Biederman, 2002).

However despite the underlying neurobiological basis of the disorder and the continued emphasis on pharmacological treatments, research and clinical attention is now turning to consider the role of psychosocial interventions in the treatment of adult ADHD (Young, 1999).

Psychosocial approaches aim to reduce the negative impact of ADHD symptoms on daily functioning by educating adults with ADHD about the disorder and teaching coping strategies and skills training such as organisational skills, time management, and self verbalisation. Although systematic investigation regarding the efficacy of psychosocial approaches is still in its infancy, a number of studies have documented the efficacy of psychosocial interventions for adults with ADHD (Safren, et al., 2004; Stevenson, Whitmont, Bornholt, Liversey, & Stevenson, 2002; Stevenson, Stevenson, & Whitmont, 2003; Young, 1999, 2000, 2004). Studies have also reported the benefits of cognitive behavioural therapy for adult with ADHD (Safren et al., in press; Wilens & McDermott, 2000). Arguably psychosocial approaches offer individuals a potentially effective way of managing the symptoms of ADHD and in so doing may help them meet the tasks and demands of university life.

Process and Personal Issues Raised

One of the most frustrating aspects of conducting this research was having to abandon a previous study in late Autumn 2004, after going through the complex and lengthy process of applying for ethical approval under a newly revised NHS ethics application system, the Central Office for Research Ethics Committee (COREC). Ethical approval for the initial study could not be granted without considerable revisions, and the timescale for completing this large scale research project could not accommodate the time needed to make such revisions. The period between deciding not to pursue the first study, and commencing the second study was particularly anxiety provoking due to the time pressure of having to develop a new research idea and launch a new study with only seven months for data collection and write up.

It was personally extremely challenging to remain motivated and focused upon achieving the goals I had set myself as part of completing my Doctorate of Clinical Psychology.

That said I have enjoyed the process of conducting the present research study more than I anticipated. I have certainly gained a greater understanding of the process and practical difficulties and frustrations involved in conducting research. Specifically in this study the response rate from potential participants was disappointingly low and due to the constraints placed upon the study additional measures to enhance response rate were not as effective as expected. It has been interesting and rewarding observing myself develop a range of skills through the research process including not only formal research skills but also organisational, time and anxiety management skills (for the times events didn't run smoothly). In addition I feel I have learned a tremendous amount about attention deficit hyperactivity disorder in adulthood, an exciting new area of research and clinical interest.

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SECTION FIVE: WORD COUNTS

Word counts

Thesis component	Word count
Title	14
Main abstract	200
Ethics proposal	2466
Literature review	7375
Research paper	5505
Critical review	2885
Total	18445
Other components	
Contents	119
Declaration	97
Acknowledgements	133
Abstracts	
Literature review	137
Research paper	110
References	
Ethics proposal	1152
Literature review	3300
Critical review	1415
Appendices	
Research protocol (including references)	2718
Information sheets and consent form	1176
Research questionnaires	2214
Tables	430
Total	13001
Overall total	31446