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**A CRITICAL EXAMINATION OF THE EVIDENCE FOR EFFECTIVE REASONABLE
ADJUSTMENTS FOR ADULTS WITH ATTENTION DEFICIT HYPERACTIVITY
DISORDER IN THE WORKPLACE**

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PhD

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October 2020

Declaration

I confirm that the work presented in this thesis is entirely my own.

Abstract

The thesis adopts a critical realist paradigm using mixed methods to scrutinise available evidence of effective reasonable adjustments for adults with ADHD (ADHDers). It makes an empirical contribution to research by examining the efficacy of adjustments.

The first four studies synthesised and aggregated the available evidence. A rapid evidence assessment of 12 measures of adult ADHD and a systematic review of 161 studies of interventions revealed a gap in research evidence for work-related support and understanding of ADHD. Most research examining support for ADHD is pharmacological, adopting the medical model of disability. The evidence was then evaluated through a meta-analysis of 12 studies to investigate the effectiveness of the support on work-related outcomes. Findings indicated a small positive effect. Once the research evidence was fully mapped, evidence from practice was compared to research. A template analysis of workplace online advice reflected the practical guidance and placed managers in a central role of support for ADHDers.

Findings from these four studies highlighted the need for an adjustment that adopted a social model approach, targeting those around the individual. Therefore, an e-learning programme was administered to 62 managers/HR professionals (crucial gatekeepers in the adjustment decision-making process), 37 in experimental group and 25 in the control group, using a random-control design. The e-learning programme increased knowledge of reasonable adjustments and ADHD while improving overall granting. Consequently, heightened awareness resulting from the programme transferred to other disabilities. Stereotypical comments reduced in the experimental group, and participants were better able to justify why the adjustment would be beneficial.

The present thesis contributes to the underdeveloped psychological theory related to adjustments and provides preliminary evidence that educating gatekeepers can increase awareness and improve decision-making regarding adjustments. Implications for research and practice are discussed for a more inclusive workplace for ADHDers.

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Chapter 1 Thesis overview and conceptual definitions

Statistics indicate that an estimated 3.5% of the global workforce are likely to have Attention Deficit Hyperactivity Disorder (ADHD) (de Graaf et al., 2008). Compared to adults without ADHD, having ADHD is associated with poorer work performance, poor job retention, under- and unemployment, and poor work-related wellbeing (Adamou et al., 2013; Küpper et al., 2012; Painter et al., 2017). Therefore, it is imperative that adequate workplace support is in place to mitigate these outcomes (Adamou et al., 2013). Under the UK Equality Act, ADHD can be considered a disability, and therefore there is a legal obligation for employers to provide reasonable adjustments for disabilities to avoid discrimination (GOV.UK, 2010). In the workplace, reasonable adjustments (UK terminology), also known as accommodations (U.S and Australian terminology), are changes to an employee's environment that enable the employee to access, perform, and thrive (Schartz et al., 2006). The present thesis critically discusses the evidence for effective reasonable adjustments in the workplace for adults with ADHD.

Thesis Question, Aims and Rationale

The thesis question is formed based on the social, legal, and practical implications for supporting adults with ADHD in the workplace and the evidence-practice gap (Arnold et al., 1992). From a research perspective, evidence supporting the effectiveness of reasonable adjustments is minimal, especially in relation to supporting employees with ADHD (Gordon & Fabiano, 2019; Schartz et al., 2006). Furthermore, there is a lack of psychological understanding of the adjustment process (Colella & Bruyère, 2011). Therefore, the main challenge for practitioners lies with managers and HR professionals who are advised to follow best practice and evidence-based recommendations with limited evidence and minimal resources (Briner et al., 2009). In addition, available evidence has been critiqued for poor transferability to practice (Anderson et al., 2001). These practical challenges emphasise the gap and need for an evidence-base that can guide workplace decisions (Doyle & McDowall, 2019). Therefore, this thesis adopts a pragmatic approach to bridge the gap between research and practice to start contributing to an evidence-base for practical solutions. To address the overarching question *what is the evidence for effective reasonable adjustments for adults with ADHD in the workplace* the thesis has three aims:

- a) to acquire and appraise existing evidence associated with workplace challenges and support for adults with ADHD,
- b) to examine the effectiveness of the existing support and compare this to the practical guidance and,

c) to apply the evidence-base generated to develop and evaluate an adjustment for adults with ADHD.

Methodology and Paradigm

The overarching research question is assessed using a mixed methodological approach using a combination of quantitative and qualitative methods to fully address the question (Creswell, 2014; Russel et al., 2016). Mixed methods allow for a deeper understanding of effectiveness which in turn can better inform the final aim of the thesis to design and evaluate an adjustment (Creswell & Plano Clark, 2007). The ontological position of critical realism is aligned with mixed methods because it encourages methodological eclecticism as ways of understanding complexity whilst also critiquing the subjective experience and the context (Fletcher, 2017). In the present thesis a range of methods are employed to answer the overarching research question from a variety of perspectives whilst taking account of the a) variation in conceptualisations of ADHD, b) variation in approaches to support from multiple disciplines, and c) the workplace context and UK legislation.

Critical realism acknowledges complexity by arguing that there are multiple levels of reality that exist independently of our identification of them (Bhaskar, 2008). For example, broad levels of reality are the 'ideally real' concepts such as discourse, signs, beliefs and ideas, 'artefactually real' objects including material and natural objects, and 'socially real' social structures/states like unemployment (Steve, 2005). Hence, critical realism is a response to the polarization of positivism and constructivism because it acknowledges that whilst there is a reality, there are limits to how humans can perceive reality (Alvesson & Skoldberg, 2009). Bhasker (2008) argues that critical realism addresses the interplay between human agency and social structures further emphasising that social science is the study of the way reality is perceived in the social context rather than at the individual level which is inevitably reductionist. Therefore, as a lens, critical realism is applied in the thesis because the workplace context is understood to be vital in understanding the effectiveness of reasonable adjustments and to limit interpretation of effectiveness to the individual's perception neglects the fact that individuals perceive reality actively within their social contexts.

Hesketh and Fleetwood (2006) further argue that there is a place for critical realism in organisational and management research because organisations are complex systems that cannot be understood fully through an empirical and scientific approach. Realist evaluation methods adopt a critical realist perspective emphasising the importance of context and mechanisms in understanding reality is exploring why and how concepts are the way they are (Porter & Halloran, 2012). Consequently, a critical realist perspective can be applied to uncover how individual and contextual

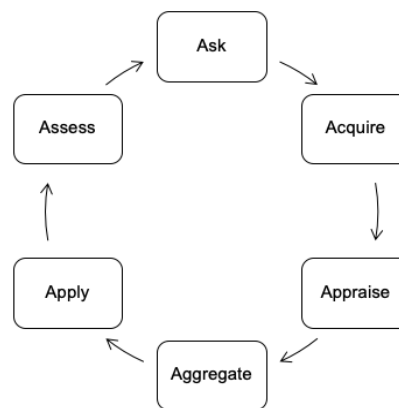
mechanisms are related to the effectiveness in reasonable adjustments from multiple perspectives using mixed methods acknowledging that effectiveness will change over time (Porter & Halloran, 2012).

Thesis Structure

Following the need for best practice advice for practitioners, this thesis adopts the evidence-based management approach to answering the overarching question *what is the evidence for reasonable adjustments for adults with ADHD in the workplace?* The thesis aims and structure broadly reflect the six steps (see Figure 1.1) associated with effective evidence-based management (EBMgt) (Barends et al., 2014).

Figure 1.1

The six steps of evidence-based management



The first step in EBMgt, titled *ask*, is to develop a research question based on a common practical issue in management. The issue here is both the practical challenges and limited evidence base for implementing effective reasonable adjustments for ADHD (*Chapters One and Two*).

The second and third step, named *acquire* and *appraise* respectively, require a systematic search of the evidence and a critical examination of the relevance of this evidence in accordance with the identified problem (Barends & Rousseau, 2018). These steps form the first aim to acquire and appraise existing evidence associated with workplace challenges and support for adults with ADHD. To examine what literature exists to inform current conceptualisations and workplace challenges for adults with ADHD, a rapid evidence assessment of the measures of adult ADHD was conducted (*Chapter Three*). This was followed by a systematic review of the documented interventions for adults with ADHD with the intention of identifying any activities that are transferrable to the workplace context (*Chapter Four*). A realist evaluative approach was adopted throughout the systematic review to focus not only on what works but for whom, why, and in which contexts (Pawson, 2013). Not only

does this help identify the activities associated to the workplace context, but also draws attention to the theory underpinning these. Both the rapid evidence assessment and the systematic review methodology require a systematic search and critical appraisal so are methods that directly relate to acquiring and appraising the evidence.

The fourth step is titled *aggregating* and is defined as weighing and pulling together the evidence and forms the second aim of the thesis to examine the effectiveness of the existing support and compare this to the practical guidance. *Chapter Five* weighs up the evidence for both pharmacological and psychosocial interventions/activities on work-related outcomes using the method of meta-analysis to provide an overall statistical judgement of effectiveness. The next study builds on the findings of previous studies to develop a template of common themes related to workplace advice (*Chapter Six*) which is then applied to online workplace support and guidance for ADHD. Online guidance is argued to be more readily accessed by practitioners making reasonable adjustment decisions. The subsequent template and thematic analysis bring together both the online and research evidence for reasonable adjustments for ADHD providing an evidence-based framework for understanding challenges employees with ADHD face as well as identifying the most effective mechanisms for support.

The final aim of the thesis is to apply the evidence-base generated to develop and evaluate an adjustment for adults with ADHD which was formed from step five in the EBMgt process titled *apply* (Barends & Rousseau, 2018). The apply step is defined as incorporating the evidence into the decision-making process. To gain an understanding of the reasonable adjustment decision-making process specific to ADHD adjustments the baseline data (prior to the intervention) is examined in *Chapter Seven*. Then the evidence is incorporated to design and apply an intervention which aimed to increase knowledge about reasonable adjustments and ADHD to better inform managers and HR professionals (*Chapter Eight*). The evaluation of the effectiveness of the intervention as well as the recommendations for future research and practice are linked to the final stage in the EBMgt process titled *assessing*. Here, outcomes are the focus and are critically discussed in terms of what the evidence is for effective reasonable adjustments for adults with ADHD (*Chapter Nine*). The whole process of EBMgt is argued to be iterative and have an overall goal to increase the likelihood of a favourable outcome, which is the dissemination of the findings from the thesis to better support adults with ADHD at work (Barends & Rousseau, 2018). Table 1.1 outlines the six steps with the subsequent thesis aims, chapter number, chapter aims, and method related to each step.

Table 1.1

Thesis structure in relation to the six steps of evidence-based management, the study number and aims, and the study method

Thesis aims	Evidence-based management steps	Chapter no	Chapter aims	Method
	Asking	1	To outline the existing social, legal, and practical contexts involving the definition of disability, reasonable adjustments, and adult ADHD. Research question: <i>what is the evidence for effective reasonable adjustments for adults with ADHD in the workplace?</i>	Literature review
	<i>Translating a practical issue or problem into an answerable question</i>	2		
To acquire and appraise existing evidence associated with workplace challenges and support for adults with ADHD	Acquiring	3	Map the evidence base relating to how adult ADHD is measured and conceptualised and whether workplace challenges are included in these measures	Rapid evidence assessment
	<i>Systematically searching for and retrieving evidence</i>	and		
	Appraising	4	Synthesise existing evidence on interventions that support adults with ADHD at work	Systematic review using a realist evaluation framework
	<i>Critically judging the trustworthiness and relevance of the evidence</i>			

To examine the effectiveness of the existing support and compare this to the practical guidance	Aggregating	5	Examine the efficacy of the existing documented interventions on work-related outcomes	Meta-analysis
	<i>Weighing and pulling together the evidence</i>	and 6	Examine whether the practitioner guidance online uses an evidence-base and what reasonable adjustments are suggested to be effective	Template and thematic analysis
To apply the evidence-base generated to develop and evaluate an adjustment for adults with ADHD	Applying	7	Examine the predictors in the adjustment decision-making process for managers and HR professionals and whether they differ for ADHD-related adjustments?	Randomised-control trial design
	<i>Incorporating the evidence into the decision-making process</i>	8	To what extent an e-learning programme aimed at managers and HR professionals can be considered an effective reasonable adjustment for adults with ADHD	
	Assessing	9	What is the evidence for effective reasonable adjustments for adults with ADHD?	Recommendations for future research and practice
	<i>Evaluating the outcome of the decision taken</i>			

Note. Definitions of steps in the EBMgt process adapted from “Evidence-Based Management: The Basic Principles,” by E. Barends, D.M. Rousseau, and R.B. Briner, 2014, Center for Evidence-Based Management, Amsterdam (<https://www.cebma.org/wp-content/uploads/Evidence-Based-Practice-The-Basic-Principles.pdf>).

Conceptual Definitions and Overview of Research

Prior to discussing adjustments, it is important to consider and outline the conceptual definitions of ADHD and disability. There have been some fundamental societal shifts in the understanding of both. For instance, ADHD was previously considered a condition which diminished in adolescence and the neurodiversity movement has placed importance on defining difference not disability. The next sections critically discuss these conceptualisations and state the position of the thesis within them.

Attention Deficit Hyperactivity Disorder (ADHD)

This section discusses the clinical definition of Attention Deficit Hyperactivity Disorder (ADHD) according to diagnostic criteria and outlines the diagnostic process.

Defining ADHD. ADHD is a term used to describe a neurodevelopmental condition that up until recently was believed to be specific to childhood marked by difficulties in attention and increased impulsivity. Initially thought to be affecting children (and in particular boys only), ADHD began to be recognised as a condition that could continue to adulthood between the years 2008-2013 when formal guidelines and diagnostic material included the adult experience of ADHD (Matheson et al., 2013).

Diagnostic Markers. One tool to diagnose ADHD is The Diagnostic Statistical Manual of Mental Health Disorders. The most recent version is version five, which was released in 2013 (DSM-V) (American Psychiatric Association, 2013). It is the most common manual used in the UK compared to other manuals such as the International Classification of Disorders; ICD (Lee et al., 2008; World Health Organisation, 2019). The criteria for diagnosis do not differ greatly between them with the DSM stating that the individual must present with a: “persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development”. The three core symptoms of inattention, impulsivity, and hyperactivity are identified using a checklist of further symptoms in which an individual must have five or more symptoms present for the last six months to receive a diagnosis. Examples can be found in Table 1.2.

Table 1.2

Examples of inattentive, hyperactive, and impulsive symptoms as found in the DSM-V

Inattentive	Hyperactive/impulsive
<ul style="list-style-type: none">• often has difficulty sustaining attention on tasks• often distracted by extraneous stimuli• has trouble organising tasks and activities• often forgetful in daily activities• often avoids or is reluctant to engage in tasks that require sustained mental effort	<ul style="list-style-type: none">• often talks excessively• often has difficulty awaiting their turn• is often "on the go" acting as if "driven by a motor"

These symptoms must not be context specific but must have a negative impact across contexts for example, social and/or academic/occupational activities. Clinicians then classify the diagnosis as combined, hyperactive or inattentive type and then rate the symptoms as mild, moderate or severe.

The DSM-V emphasises that the symptoms must present themselves uniquely and be ruled out as a symptom related to another condition. Unpicking symptoms relating to other disorders is especially difficult in practice due to the co-occurrence of the condition (Grogan et al., 2017).

Diagnostic Process. To receive a clinical diagnosis of adult ADHD in the United Kingdom, an individual typically is referred to a psychiatrist by their general practitioner (GP) (NHS UK, 2019). The psychiatrist would then carry out an assessment process and provide a formal diagnosis. The process involves the individual completing self-report questionnaires followed by a clinical interview with the individual. Additionally, where possible, school reports and parent or partner reports of behaviours are included. To receive a referral from their GP, the individual would have to self-assess and report symptoms which is problematic because most individuals with ADHD are not aware that they have ADHD (Waite et al., 2013). The most frequent way of becoming aware that an individual may have ADHD in adulthood tends to be when their child is referred for an assessment or if they have been referred to a psychiatrist for a mental health condition (Bhat & Paris, 2014). In all cases a certain level of knowledge is expected from the GP and the psychiatrist about adult ADHD (Tatlow-Golden et al., 2016) but as this is specialist and recently recognised adult diagnosis, individuals are often misdiagnosed (Biederman et al., 2014). Plus, in the UK the process can last over one year because of waiting lists and limited support services (Matheson et al., 2013).

Multiple disciplines have attempted to better understand the ADHD diagnosis in adults. Medical perspectives have used neurological sciences to identify an ADHD brain whereas psychological perspectives have focused on the psychosocial risk factors that contribute to the presentation of ADHD like symptoms.

Approaches to Conceptualising ADHD

Thus far, the clinical diagnostic criteria for ADHD and the process for receiving a diagnosis have been outlined. However, there are various conceptualisations of ADHD namely the medical/clinical, psychological and social understandings. Each conceptualisation of ADHD is rooted in how disability is constructed and understood in society.

ADHD as a Disability

According to the UK Equality Act, published in 2010, an individual has a disability if: “the person has a physical or mental impairment, and the impairment has a substantial long-term adverse effect on the individual’s ability to carry out normal day-to-day activities.” (GOV.UK, 2013, para. 1). Disability has long been defined in society through the traditional medical model (Shakespeare, 2006). The medical model adopts the perspective that an individual who deviates from the norm requires treatment or intervention from a medical professional to become more like the norm (Garland-Thomson & Holmes, 2005). The medical professional will then provide treatment or

intervention until the individual with a disability is able to function as adequately as possible in society or is less impaired (Thomas, 2004).

Neuroscience and Biological Approach. Approaches aligned to the medical model are neuroscience and biological approaches where differences in developments of the brain are deemed abnormal and compared to what is considered normal. Cross cultural and neurological research has argued that adult ADHD is persistent and observable in the brain and prevalent in a number of cultures (Bauermeister et al., 2010; Hasler et al., 2016; Schneider et al., 2006). Twin and family studies also indicate that ADHD is strongly hereditary suggesting a biological component to the disorder (Larsson et al., 2012). Despite these findings, much of the imaging research is on children rather than adults (Krain & Castellanos, 2006). Further research on adults is required to support the initial neuroimaging work that identifies observable differences and whether these differences reflect the changes in symptomatology from childhood to adulthood (Moffitt et al., 2015). Additionally, there is a limit to what neuroscientific explanations of ADHD can offer, because they cannot inform strategies to cope with having a different mechanisms and networks in the brain and they cannot explain the social and emotional behaviours observed in individuals with an ADHD diagnosis (Natcher, 1998; Wastell & White, 2012).

Psychological Models of ADHD. Models that have attempted to understand ADHD from a psychological perspective have adopted cognitive, behaviourist, emotional and social understandings of ADHD. Each of these models take a pragmatic approach to try and support the functioning and well-being of people with ADHD by offering an alternative perspective to the neurological understandings (Barkley, 1997; Harpin, 2005). Arguably, a medical model of understanding is still prevalent here because the focus is on how the individual deviates from others.

Cognitive and Behaviourist Approaches. Cognitive perspectives have attempted to explain ADHD through models relating to cognition and their influence on behaviour. Barkley (1997) has been at the forefront of this research arguing that ADHD is a deficit in behavioural inhibition, which influences the individual's working memory and self-regulation. Conversely, this perspective takes account of the cognitive consequence of having a mind that is 'on the go' rather than simply stating that ADHD is purely related to hyperactivity and attention. Inattentiveness has been reported to be observed in behaviour such as impatience, disorganization, and frequent lateness which has an impact on a person's organisation and time management (Brod et al., 2012).

Cognitive models explain that these difficulties are a result of the prefrontal cortex (which deals with executive function like problem solving) being overloaded with

thoughts which are interfered with the impulsivity and emotion experienced by the individual (Shaw et al., 2014). It is, however, difficult to objectively measure cognition because a thought in itself is not tangible (Matlin & Farmer, 2013). Therefore, the method used to measure the associations between cognition and behaviour is correlational, rather than causal (Altman & Krzywinski, 2015).

Emotion and Psychosocial Approaches. Adult ADHD has been associated with challenges with emotional regulation which in turn negatively impacts social interactions (Harpin, 2005). It is argued that adults with ADHD have an increased emotional reactivity and a lower tolerance of frustration which can be damaging when combined with a heightened sense of failure from experiences (Friedman et al., 2003; Skirrow et al., 2014). The high levels of emotion experienced have a negative impact on the understanding of other people's emotions because the individual is unable to focus on anything other than their own (Torrente et al., 2014).

ADHD Through the Social Model of Disability

In contrast to the medical model, the social model of disability understands disability through a social constructivist or creationist lens, arguing that it is not the brain that is flawed. Instead, the way society has constructed barriers that limit and categorise individuals which consequently disables them (Thomas, 2004). The social model further argues that society should adapt to the individual rather than the individual to society as any definition of disability depends on perspective, culture, and context which influence stigma, labelling, and identity (Barnes & Mercer, 2010; Finkelstein, 2001). Thomas (2004) argues that the contrasting models have caused a disciplinary divide which has had a significant influence on research and practice.

Since the social model of disability was first outlined, activists have attempted to shift societal thinking and understanding of what it means to be disabled towards a more positive and less medicalised light (Kapp et al., 2013; Shakespeare, 2013). Neurodiversity is a term coined by sociologist Judy Singer, inspired by the autism and disability rights movements to shift societal views of disability to understand autism as part of a natural diversity in human biology rather than an illness (Armstrong, 2010; Singer, 1999). The term, neurodiversity, itself is adapted from the word biodiversity which encapsulates the idea that, the more varied the ecosystem, the better potential for the environment (Singer, 1999). Therefore, ADHD can be considered as a form of neurodiversity with suggestions that skills such as hyperactivity and easy distractibility were developed as part of an evolutionary advantage (Hartmann, 2016).

Since its formation, the definition of neurodiversity has been extended to describe a concept, an approach, and individuals themselves (Armstrong, 2015; CIPD, 2018; Jaarsma & Welin, 2012). The neurodiversity movement has evolved beyond

autism and includes activism and research on a wider range of specific learning conditions including ADHD, Developmental Co-ordination Disorder (previously known as Dyspraxia), Dyslexia, Tourette's Syndrome, Dyscalculia, and Dysgraphia (Weinberg & Doyle, 2017). Although the concept has broadened to encompass a range of conditions, the original intention to alter the way society understands diversity in a more positive light has remained.

Through the lens of ADHD as part of neurodiversity, there are several strengths that are commonly reported and observed in people with ADHD (CIPD, 2018). These strengths include creativity, courage, curiosity, and resilience (Sedgwick et al., 2019). It is argued that these natural cognitive styles have been medicalised and penalised in the education and workplace systems which have been formed with average cognitive styles in mind (Arnold et al., 1992; Hartmann, 2016). As the environment do not accept or facilitate neurodiversity, strengths are not recognised, with a detrimental impact on a person's self-esteem and overall wellbeing (Newark et al., 2016). Through the social model understanding, these systems are viewed as barriers and should be the target of any intervention instead of the continued focus on changing the individual (Foster, 2017).

It is important to distinguish between the neurodiversity movement and neurodiversity research. Understanding ADHD as a deficit or disorder which requires intervention is in line with the history of psychology and psychopathology focused on repairing or remediating damage (Seligman & Csikszentmihalyi, 2000). The positive psychology movement (PPM), headed by Peter Seligman, aimed to shift the focus to a different approach to research that also focused on positive wellbeing and strengths (Wood & Tarrier, 2010). Similar to the PPM, the neurodiversity movement attempts to challenge the dominant medicalised discourse from understanding ADHD as a deficit and instead as a difference and like the PPM, with a focus on positive aspects (Greven et al., 2018). Therefore, the research on ADHD should also be balanced and include aspects of positive functioning which at present, there is limited research that addresses this (Sedgwick et al., 2019). The present thesis attempts to contribute to the literature by focusing on any social barriers in the environment rather than attempting to adjust the individual and investigating whether there are any strengths identified in the existing literature.

The ICF Model. A more recent attempt to encompass and understand disability is the World Health Organisation's (WHO) International Classification of Functioning Disability and Health (ICF) (Bickenbach, 2012). The fundamental principles of the ICF model is that it takes a biopsychosocial approach to understanding health recognising that the environmental and personal factors interact and that there are activity

limitations and participation restrictions as a result (McDougall et al., 2010). It is therefore argued to be a combination of both medical and social models of disability (Shakespeare, 2006). Although this model acknowledges the interaction between the environment and the person in their participation in work, I draw more on the social model of disability in the present thesis. I do this for several reasons, the first is that work is a social context and phenomena, society contributes to what work is, how work is designed, and the policies and practices within organisations (Thompson et al., 2016). Therefore, I focus on these barriers which are arguably the main challenges for adults with ADHD to access and participate in work. To add, the ICF predominately focuses on participation in work rather than the wellbeing and success of those with ADHD which is promoted from a neurodiversity perspective also adopted in this thesis (Mitra & Shakespeare, 2019). The second reason is that the ICF model categorises all environmental barriers together whereas, the workplace is more complex and forms only part of the environmental barriers an individual experiences (Mitra & Shakespeare, 2019). Finally, the ICF model was designed to be applied on an individual basis to outline relevant care. In contrast, the approach in this thesis is to look more at contextual factors, adopting a top down rather than bottom up approach to intervention design (Bakker, 2015). Although the ICF model incorporates the relationship between the individual and the environment, it remains a medicalised perspective identifying the individual's limitations, impairments, and functionality. Consequently, there is no acknowledgement of the understanding of disability as a difference in line with the neurodiversity perspective. In sum, the ICF is advantageous in that it recognises the interaction between the person and the environment, but for the current thesis the workplace environment and associated barriers are the main focus, hence the social model of disability is utilised as a framework for understanding support.

Summary of Conceptual Definitions

As with disability more broadly, defining and conceptualising ADHD is complex. There are different definitions within different disciplines, and these inevitably impact the type of support available. Acknowledging complexity in conceptual definitions is in line with the critical realist understanding of disability where no definition dominates over another (Shakespeare, 2006). The present thesis adopts a pragmatic and critical realist approach, acknowledging complexity but recognising the need for a focus on ensuring a multidisciplinary solution to reasonable adjustments in a workplace context.

A Comment on Language

Since the term neurodiversity began to be used among activists, there have been developments and debates around the language used to describe disability as a category and individual disabilities themselves (Dunn & Andrews, 2015). It is a political

and emotive topic with many activists advocating for recognition of the right definition and the correct use of language (Jaarsma & Welin, 2012). Terms such as neurodiverse and neurodivergent have emerged to describe individuals who identify as being different and neurotypical has been used to describe a person who has typical development (CIPD, 2018). Language is continuously changing with more recent requests to use the term neurominorities (Doyle, 2020). Therefore, it is important to recognise language use in research and practice to move away from ableist discourse and approaches (Bottema-beutel et al., 2020). Researchers have a role in how language is constructed and interpreted especially when communicating research findings to practitioners and laypeople (Danforth & Navarro, 2001). For these reasons, it is important to justify my position and language use as a researcher.

I adopt the social model understanding of disability in the thesis to include a focus on how the environment can be adjusted to support a more inclusive workforce. By adopting this model and defining ADHD as a part of neurodiversity, I have, on occasion, referred to adults with ADHD using the preferred and newly constructed term an ADHDer or ADHDers (Bertillsdotter Rosqvist et al., 2020). I have additionally used the term neurominority as an umbrella term to refer to a group and individual who identify themselves as having a condition such as ADHD, autism, dyslexia, dyspraxia, and Tourette's syndrome. However, there is a need to distinguish between child and adult ADHD, especially as the workplace is an experience unique to adults. Therefore, to assist with clarity I have used person-first language and described ADHD adults as 'adults with ADHD'. Whilst I use these terms interchangeably, I acknowledge that ADHD is a disability in current society and do not wish to undermine the impact ADHD can have on an ADHDers experience or the influence and importance of language.

As several terms and their conceptualisations have been introduced in this chapter, which are referred to throughout the thesis, their definitions are outlined in Table 1.3.

Table 1.3*Terms used in the thesis and their conceptual definitions*

Term (acronym)	Conceptual definition
ADHD	A disability with three key diagnostic markers of inattention, hyperactivity, and impulsivity. Can be considered a hidden disability and understood as neurodiversity.
ADHDer	A person who identifies as having ADHD.
Disability	Legally a disability is the impairment that an individual has, mental or physical, that has a long-term impact on their ability to conduct their day-to-day activities (includes both physical and hidden disabilities).
Evidence-based management (EBMgt)	The concept that managers should make decisions based on high quality evidence.
Neurodiversity	Neurological differences in individuals that can be understood as biological variations.
Neurominority	An umbrella term for individuals who identify as belonging to a group of people who have a neurological difference (includes but not exclusive to autism, ADHD, dyspraxia, dyslexia, and Tourette's syndrome).
Reasonable adjustments	Adaptations to the workplace that enables disabled individuals to be equally productive as those without a disability.
Social cognitive theory (SCT)	Social and cognitive factors influence behaviour.
Stigma	Negative assumptions or expectations placed on an individual by another.

Chapter 2 ADHD and the workplace context

Building on the conceptual definitions outlined in Chapter One, Chapter Two discusses ADHD in the context of the workplace. First, work-related challenges and strengths associated with ADHD, as identified in the literature, are outlined. Second, the research on work-related support is presented followed by an explanation of the existing legal workplace support known as reasonable adjustments. This chapter concludes with a discussion of the contextual constraints associated with ADHD and reasonable adjustments including stigma and disclosure.

ADHD at Work

It is estimated that two in three children with ADHD continue to experience symptoms of ADHD in adulthood (Moffitt et al., 2015; Young, 2000). ADHD has a life-long impact and adults with ADHD are more likely to experience divorce, academic underachievement or failure, incarceration, and even early death (Arnold et al., 2015; Brod et al., 2012). These negative experiences lead to a lower quality of life, lower self-efficacy, self-esteem, and self-image when compared to adults without ADHD (Young, 2000). Therefore, it is a moral and social imperative that adequate support is in place for adults with ADHD for their well-being and quality of life (Doyle & McDowall, 2019). The present thesis and subsequent discussion in this chapter focuses on the workplace as one aspect which is unique to the adult experience of ADHD and is argued to have the strongest impact on quality of life for adults with ADHD (Pitts et al., 2015). In the workplace context, adults with ADHD are more likely to experience job instability, poorer performance, absenteeism, unemployment and underemployment (Adamou et al., 2013; Gordon & Fabiano, 2019).

The majority of research focuses on documenting the associations between ADHD and broad outcomes such as, educational and occupational attainment. Consequently, research on workplace support and ADHD is minimal and fragmented, appearing in a wide scope of journals from the *Journal of Business and Management* to *Disability and Rehabilitation*. In addition, the minimal research could also be partially due to the challenges with receiving a diagnosis, the recency of ADHD recognised as an adult diagnosis, or the stigma associated with a diagnosis (Mueller et al., 2012). I next provide a summary of the workplace challenges and strengths associated with ADHD.

Workplace Challenges

The workplace challenges associated with ADHD and how they are linked to the symptomatology are described below. The impact of these challenges on the individual is then discussed as well as a criticism of how workplaces are designed.

Organisation and Time Management. Challenges with the core symptoms of attention regulation and impulsivity are related to poorer organisation and time management. There is a link between poor organisation and ADHD which manifests as frequent lateness, missing deadlines and forgetfulness (Asherson, 2014; Coetzer, 2016). This relation may result from a less effective task management system (Coetzer et al., 2009). The difficulties in distractibility can have a negative impact on work productivity leading to excessive errors, challenges with managing workload, and missing deadlines (Harpin 2005; de Graaf et al., 2008; Nadeau, 2005). These difficulties are argued to contribute to the estimate of a loss of 35 days of work productivity per year (Kessler et al., 2005).

Effort. Inattention and hyperactivity can prevent the sustained effort an individual can input into a work-related task. Research indicates that a slower processing speed may be a result of information overload which may be judged as poor effort in the workplace (Hawthorne, 2010). Misinterpretation of effort can also be related to the reported laziness that often gets wrongly attached to adults with ADHD (Brown & Nadeau, 1995). Further evidence suggests that adults with ADHD are more likely than those without to have insomnia or sleep disorders that impact their performance in the workplace (Yoon et al., 2013). These challenges may also contribute to the misinterpretation of laziness and the amount of effort they are able to contribute to work-related tasks (Brevik et al., 2017).

Emotion. The relationship between emotion and ADHD is highly connected to difficulties with impulsivity. Emotional regulation is defined as the ability to monitor and reflect on emotions and adapt one's emotional response appropriately (Brackett et al., 2011). In ADHD, emotional regulation is argued to be poorer because of the challenges with inhibition and self-regulation (Brown, 2006a). The impact of poor emotional regulation can be most damaging to social interactions for an adult with ADHD and in a workplace context (Young, 2000). Successful social interactions benefit the individual, the team, and the organisation (Harpin, 2005). Extreme emotional responsiveness can lead to adults with ADHD to be perceived as aggressive or easily upset and have difficulty managing conflict often displaying an over reliance on co-workers (Coetzer & Richmond, 2007; Coetzer & Trimble 2009; 2010). Further qualitative research has highlighted that adults with ADHD tend to struggle with authority based on their high

emotionality, often resulting in leaving jobs, being fired or becoming self-employed (Bjerrum et al., 2017).

Memory. A meta-analytic review investigating adults with ADHD and their working memory synthesised 38 studies consisting of experiments where adults with ADHD are asked to complete a task that requires them to recall or recognise different amounts of information and at times ignore irrelevant information (Alderson et al., 2013). Their performance on these tasks is then compared to those without an ADHD diagnosis. The findings suggest that challenges with working memory continue from childhood into adulthood. In the workplace, challenges with working memory can manifest as forgetfulness which is also common to those with ADHD (Semerci, 2013). Forgetfulness can be a challenge at work for various reasons such as locating objects, acting on instructions and communicating ideas (Gates, 2000).

Self-concept. There are several negative experiences unique to ADHD that impact negatively on an adult with ADHD's self-concept. One example is that individuals with ADHD are more likely than those without to have poorer academic attainment and higher school exclusions despite there being no significant difference in intelligence (Chhabildas et al., 2001). These outcomes suggest a social and contextual influence on performance at school rather than an individual difference. Non inclusive educational design such as expectations to sit still in a classroom are argued to be related to the lower school attainment and reported poor behaviour (Roy et al., 2017; Young et al., 2013). Over time, these repeated struggles with a non-inclusive environment impact a person's self-esteem and self-efficacy which together have a negative impact on work-related performance (Newark et al., 2016; Stajkovic, 1998). With our employment arguably constructing our own identities and self-worth, it can be exceptionally difficult for adults with ADHD (Berzonsky, 2011). Non-inclusive environments do not only impact an individual's self-concept but also their well-being and can directly influence the common co-occurring conditions associated with ADHD such as anxiety and depression (Maddux, 2016). Retrospective studies that ask adults with ADHD to reflect on their past experiences confirm feelings of disempowerment, failure, unequipped to cope, and low self-worth (Matheson et al., 2013). These feelings were strongly related to outcomes of lower academic attainment, poor self-rated job performance, and experiences of social exclusion (Brod et al., 2012). Further research has suggested that the person-environment fit model of stress applies with adults with ADHD and that they require specific types of work that embraces their abilities and increases their well-being (Harpin, 2005).

Workplace Designs. Contextual changes to the workplace are a social and environmental aspect that should be considered as impacting the workplace

challenges for those with ADHD. Workplaces are now being designed to encourage networking and take account of changing working schedules and locations (Haynes et al., 2017). To illustrate, a result of these changes is the increase in open plan office spaces. Evidence suggests that open plan offices are not effective in increasing productivity and employees experience a loss of privacy, poorer wellbeing, and increase in distractibility (Richardson et al., 2017). This example shows how workplaces can be designed to be detrimental to those with ADHD who need minimal distractions (Veitch, 2011). Further changes include inconsistent working schedules that encourage autonomy over location and timing of work (Kelliher & de Menezes, 2019). Adults with ADHD may benefit from the increased autonomy over tasks and working hours because of the associated strengths with multi-tasking, working best at unusual hours, and independent of authority (Prevatt & Levrini, 2015). The inconsistency does become a challenge when employees with ADHD are required to schedule and plan tasks because of their difficulties with organisation and time-management (Brown, 2006a). Therefore, these are only few examples of how the way in which workplaces are designed can negatively impact adults with ADHD highlighting the organisational environment and context as crucial.

ADHD Strengths at Work

I will now review the literature that has identified several strengths associated with ADHD that are beneficial in specific workplaces. Thus far, I have argued that conceptualisations of ADHD are heavily influenced by the social context. To build on this, I have categorised the strengths based on the core symptoms to demonstrate how each symptom can be seen positively depending on the context.

Impulsivity. A relationship that is continuously replicated in studies investigating adult ADHD suggests that impulsivity is strongly linked to higher risk taking. In some work contexts risk-taking is extremely beneficial and often desired. For example, research has demonstrated that employers in the sales and marketing industries require employees to take risks because it is viewed as proactive and at times it can be desired in situations where an individual is encouraged to challenge their superiors (Campbell, 2000). Risk-taking is also perceived as beneficial in fast-paced jobs involving extreme sports, performing arts, and physical roles that are more highly extrinsically reward-focused and active (Mannuzza et al., 1993).

Another strength associated with impulsivity is creativity which is closely related to divergent thinking and novelty seeking, all higher in adults with ADHD (Asteal & Oam, 1992; Nadeau, 2005; White & Shah, 2006). Mechanisms involving impulsivity or decreased inhibition can increase openness to experience and consideration of novel or unusual ideas (Carson et al., 2003). Creativity is an essential requirement for job

roles in the arts, design, advertising and marketing where performance and success depend on the generation of creative ideas (Woodman et al., 1993).

Both risk-taking and creativity are essential for entrepreneurship and a screening study revealed approximately 29% of entrepreneurs scoring highly on self-report screening tools for ADHD (Freeman et al., 2018). A model of entrepreneurship and ADHD explored in Thurik et al. (2016) argues that the increase in likelihood is a result of the following characteristics: opportunity recognition, innovative achievement, risk taking, action orientation, and entrepreneurial intentions. These characteristics identified further emphasise the strengths that individuals with ADHD have how these can be key for certain careers. However, it is important to note that entrepreneurship is a high-risk career choice and difficult to maintain and succeed in.

Attention Regulation. Adults with ADHD are better able to multitask than neurotypical individuals, shifting their focus frequently and successfully (Nadeau, 2005). Moreover, adults with ADHD and some other neurodevelopmental conditions including autism can hyperfocus (Ozel-Kizil et al., 2016). Hyperfocusing as a verb has been coined to explain periods of extreme concentration on a task of interest that can last hours, often neglecting to attend to the person's surroundings (Kooji et al., 2018). This further emphasises that the right work role and environment can improve productivity supporting the person-environment fit theory (Painter et al., 2017). The person-environment fit theory argues that the better aligned the individuals interests and their work environment, the more productive they are (Caplan & Harrison, 1993). Therefore, if the adult with ADHD is interested in the job, they are more likely to hyperfocus and be more productive (Hupfeld et al., 2019).

Hyperactivity. Employees who work with adults with ADHD continuously report that their ADHD colleagues can be high in energy, attentiveness and passion which can increase team motivation and influence others (Reynolds et al., 2011). When high energy is combined with hyperfocus, an adult with ADHD can focus for long periods of time, be attentive and passionate which all elements lead to increased productive for work-related tasks that are of interest (Hupfeld et al., 2019).

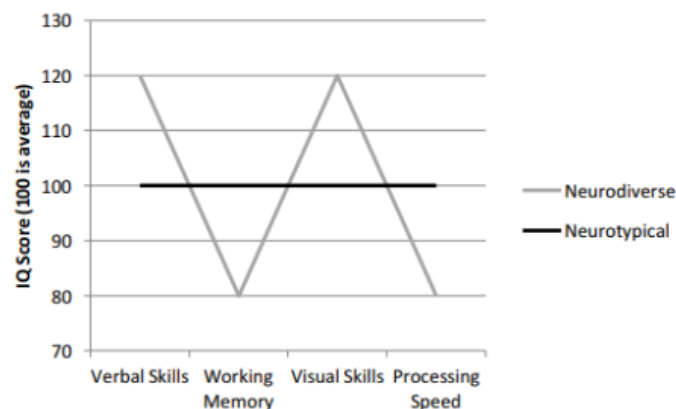
Emotion Regulation. Contrary to the research that suggests that adults with ADHD find it challenging to follow leadership, there is some evidence to suggest that adults with ADHD have strengths in being leaders themselves (Nadeau, 2005). This is arguably a result of their high responsiveness and attention to emotion, quick problem-solving, and high levels of altruism (Teschke, 2010). Acting on emotion has also been linked to passion in leaders with ADHD (Teschke, 2010). There is however a lack of research on the positive aspect of low emotional regulation because it is viewed as

having negative consequences on an individual's functioning (Peña-sarrionandia et al., 2015).

Intelligence. The Wechsler's intelligence scale for adults is a method used in practice for assessing for neurominorities (Weinberg & Doyle, 2017). The scale is comprised of two groups of subtests that measure overall performance and verbal reasoning (Wechsler, 2008). The verbal reasoning tests are measures of general knowledge, language, reasoning and memory skills. Usually the average score of all the tests is calculated and is used as an assessment of intelligence. Large discrepancies between subscales or what is commonly referred to as a spikey profile indicates neurodivergence (Doyle, 2018; Frith & Happé, 1994). It is argued that although everyone scores differently across the scales and have their own unique strengths and weaknesses, for neurodivergent individuals the differences in scores is greater. An illustration from their report is shown in Figure 2.1.

Figure 2.1

A graph depicting neurodiverse and neurotypical IQ scores



Note. From "Psychology at work: Improving wellbeing and productivity in the workplace," by A. Weinberg and N. Doyle, 2017, British Psychological Society, October Issue p. 44.

Commonalities in scores in adults with ADHD show good performance in measures of verbal and visual ability but poorer performance in working memory and reading ability (Theiling & Petermann, 2016; Weinberg & Doyle, 2017). The inconsistency in performance is argued to be misinterpreted in the workplace as poor attitude or motivation which can lead to co-workers and line managers making incorrect assumptions about an individual's effort and performance and more importantly their intelligence (Kelly & Ramundo, 2006). Therefore, the construction and the assessment of intelligence should consider the differences between and within people when being used in the selection and assessment of individuals for work. Consideration of these findings are especially relevant for the recent rise in cognitive ability tests (GCA) here

being the overall score, used in selection decisions due to GCA being the strongest predictor of workplace performance (Schmidt & Hunter, 2014).

Workplace Support for ADHD

Neurominorities face challenges at each stage of employment from recruitment to retirement (Chan et al., 2010). To illustrate, adults with dyslexia may find it harder to complete cognitive assessments based on working memory that impact their likelihood of being hired for a role based on their cognitive assessment results (Beetham & Okhai, 2017). In addition, adults with autism may find the transition to retirement challenging as a consequence of a resistance to change (Hodges et al., 2004). Neurominorities are also at a higher risk of developing co-occurring conditions related to stress, anxiety and depression (Ormel et al., 1994). If neurominority employees are not supported appropriately within their organisation, workplace challenges can lead to more days on long-term sick leave, an increase in workplace bullying, and lower productivity (Weinberg & Doyle, 2017). Therefore, it is fundamental that neurominorities receive appropriate support throughout their working lives, from finding, remaining in, and being successful in employment. Conversely to any anticipated negative workplace outcomes, there are many noted benefits of employing a diverse workforce both for individuals and organisations. For individuals, employment increases self-awareness and motivation to work (Vorhies et al., 2012).

As discussed, there are a range of challenges in the workplace for adults with ADHD and several strengths. Therefore, support in the workplace is required to address the challenges and embrace the strengths. Statistics suggest that adults with ADHD have on average 5.4 jobs across a 10-year time frame compared to 3.4 jobs on average in a control group (Biederman, 2006). Therefore, adults with ADHD are argued to have careers that include a range of work roles. Authors have highlighted that those adults with ADHD who endorse their strengths in a supportive environment are more likely to be in creative work roles like entrepreneurship (Antshel, 2018). However, even if employees with ADHD are in roles that are deemed most suitable to them, there is a need to focus on how best to support adults with ADHD because the challenges are unlikely to completely diminish. There is also a legal obligation to provide support in the form of reasonable adjustments which is the focus of the discussion below.

Reasonable Adjustments

In the UK, the law defines workplace support as a reasonable adjustment, known in other countries as a reasonable accommodation. I will now discuss what a reasonable adjustment is, the processes surrounding reasonable adjustment decision-making, and what makes a reasonable adjustment effective.

What is a Reasonable Adjustment?

In the United Kingdom, the Equality Act (2010) states that individuals with disabilities, whether hidden or visible, have the right to request reasonable adjustments in the workplace which are defined as an adaptation to the workplace that enables the individual to be equally productive as those without a disability (GOV.UK, 2010). Once an individual discloses, any such adjustments must be agreed and implemented at all stages of employment including the selection process (Cumming et al., 2013). Reasonable adjustments can be categorised by the 'target' of the change: the individual, the task, the environment or the organisation. An example of each are as follows (MacDonald-Wilson et al., 2001; Scroggins, 2007):

- Individual, coaching to develop strategies;
- Task, technology to improve speed of tasks;
- Environment, changes to the workspace;
- Organisation, awareness training for co-workers and leaders.

In the UK, Access to Work is a service provided by the Department of Work and Pensions that assists in providing financial support for reasonable adjustments (GOV.UK, 2018). There are similar support services in countries such as the United States of America and Australia (Cumming et al., 2013). In a recent report, reasonable adjustment provision was approved for 27,730 people in the years 2017/2018 with the most common forms of provision being assistance with travelling to work and support workers (GOV.UK, 2018). There are currently no statistics for the range of individuals with neurominority conditions requesting support from Access to Work although the report includes individuals with dyslexia separately from other disabilities revealing that nearly 5% of the total expenditure is for individuals with dyslexia (GOV.UK, 2018).

Several criticisms of the reasonable adjustment legislation exist (Goss et al., 2000). Firstly, the law states that the individual must disclose their disability in order to access the adjustments, which is especially challenging for those with hidden disabilities with an increased likelihood of stigma. Secondly, the legislation is additionally broad, vague and is not accompanied with any guidance or recommendations as to the dimensions of the support that the individual with a disability is entitled to, for example, the length of support, the investment in the support, and the type of support (Patton, 2009). As a result, employers are often left uncertain of the provision required by law to meet the employees' requests for reasonable adjustments. The responsibility is then again placed on the individual with a disability to request the reasonable adjustments they require. On one hand, this responsibility can be overwhelming, especially for an adult who has only recently received a diagnosis

after having limited support throughout their working life (Marcer et al., 2008). On the other hand, it can also be positive for adults who are seeking specific support to improve their work productivity and well-being. Finally, the legal terminology included in the Equality Act (2010) reinforces the medicalised perspective of disability, emphasising that the disability should be legitimised by a relevant medical professional prior to support.

The Decision-making Process

My review of the literature on reasonable adjustments reveals that the majority of the literature has explored the decision-making process of those who grant reasonable adjustments rather than the effectiveness of adjustments themselves. The predictors related to the granting of adjustments are typically categorised in three groups (Scroggins, 2007; Stone & Colella, 1996; Telwatte et al., 2017). The first group refers to the characteristics of the person with the disability requesting the adjustment and these characteristics include the type of disability and their interpersonal style. The second category is the factors related to the employers or gatekeepers who grant the adjustments such as attitude and experience. The third category includes the characteristics of the organisation for example, policies and design. A category of particular interest is the factors related to the gatekeepers, in the case of reasonable adjustments the key decision makers are often the employee with the disability's line manager or a HR professional because these are who the request typically gets sent to (Telwatte et al., 2017). Gates (2000) further argues for the importance of considering the adjustment process as one that is heavily influenced by the social context. Therefore, managers and HR professionals are aspects of the environment that have a key role in the adjustment process and their own decision-making processes have implications for employees with disabilities.

Existing Reasonable Adjustments

In contrast to the theoretical models above, Balsler (2007) argued that the decision-making process is different for each reasonable adjustment and focuses more on the adjustment itself rather than the individual granting the adjustment. Research refutes this finding that the most common existing reasonable adjustments were regular meetings with the employees' line manager, individual training that could involve coaching and exchanging tasks (Wang et al., 2011). One study found that 37% of employees with psychiatric conditions received support from a job coach as a reasonable adjustment (MacDonald-Wilson et al., 2002). In addition, most reasonable adjustments are argued to be inexpensive and non-disruptive to the organisation, contrary to employers' assumptions (Jackson et al., 2000). I will now discuss the only

research identified to the best of my knowledge that examines the effectiveness of reasonable adjustments in neurominorities.

Coaching as a Reasonable Adjustment. Career coaching has been suggested to be an effective reasonable adjustment for adults with dyslexia because it takes a holistic approach to both the individual and contextual challenges of dyslexia whilst recognizing and encouraging strengths (Doyle, 2018). The theoretical framework that guided the coaching intervention is Social Cognitive Learning Theory (SCLT) which describes four critical elements of a process that relate to how an individual combines both metacognition (i.e. thinking about thinking) to social learning to understand how they can develop effective strategies to reduce their challenges at work (Bandura, 1999). The last element of SCLT is titled mastery which implies that once the coachee has been through the coaching process they will have mastered helpful strategies and developed metacognition. Once mastered, these social cognitive processes are unlikely to change and when utilized across contexts there are long-term benefits which positively increase performance and self-efficacy at work (Doyle & McDowall, 2015). A further finding from Doyle's (2018) research highlights that the most common challenges for those with dyslexia in the workplace is working memory rather than the assumed challenges with reading and writing. Furthermore, Doyle's (2018) research emphasizes the importance of adopting a two-pronged approach to targeting work-related challenges, for example developing strategies related specifically to tasks as well as improving psychosocial aspects like self-efficacy.

What Makes an Effective Reasonable Adjustment?

There are many interpretations of what makes an intervention effective but there are clear benefits of effective adjustments including increased productivity for the entire organisation, better interaction with co-workers, and higher organisation morale (Pawson, 2013; Solovieva et al., 2011). Mostly, effectiveness is understood as an improvement in a skill, knowledge, or even a reduction in symptoms, negative thinking or negative events (Davies, 2006). In studies addressing the effectiveness of reasonable adjustments, there are often different perspectives of effectiveness from the stakeholders involved. For example, some studies have looked at whether co-workers, managers/HR professionals, and those higher in the organisation judged the adjustment to be effective rather than asking the individual (Schartz et al., 2006).

In addition to the stakeholder evaluations, there are differences in the reasonable adjustments themselves which influence their effectiveness (Balzer, 2007). For instance, the definition of a reasonable adjustment includes either an adjustment that improves accessibility to work compared to an adjustment that supports performance at work (GOV.UK, 2018; Schur et al., 2014). An example of accessibility

would be installation of a wheelchair ramp so the individual who uses a wheelchair can access the workplace (Butterfield & Ramseur, 2004). In contrast, an example of a performance related adjustment may be speech to text software for someone who is dyslexic (Doyle, 2018). Therefore, it is challenging to assess the effectiveness of both reasonable adjustments together because one is essential to access the workplace and the other is essential to perform as well as others at work. Adjustments that relate to accessibility are perhaps easier to assess for effectiveness because once implemented the employee can access work or not, a binary outcome of yes or no. However, measuring performance at work is a well-known challenge in the organisational literature and could be applied to measuring effectiveness of performance related reasonable adjustments (Murphy, 2008). Furthermore, there are differences in whether the reasonable adjustment is effective from the time of implementation or becomes effective after some time. For reasonable adjustments that are provided for the individual to access the workplace there is an immediate evaluation of effectiveness whereas those which aim to improve performance may be more effective in the long-term.

Another method of assessing effectiveness is grounded in evidence-based practice where it is argued that high quality evidence assists researchers and practitioners in understanding what makes something effective alongside the how and the why (Shaneyfelt et al., 2006). Therefore, it is the critical appraisal of existing evidence that is the approach that is applied in the thesis to examining effectiveness. Critical appraisal also includes the reliability and validity of evaluative measures (Shaneyfelt et al., 2006). The application of theory to better understand how the adjustment is effective is also recommended through an evidence-based approach and highlights the value of social psychology theories in understanding adjustments. However, there is a contextual barrier to understanding reasonable adjustments in that to access them prior to even examining the evidence, an individual is required to disclose their disability (Jastrowski et al., 2007; von Schrader et al., 2014). The final and subsequent section of this chapter discusses the challenges with disclosing a disability at work.

Hidden Disability, Stigma and Disclosure at Work

Workplace statistics reveal that individuals with mental health conditions and learning difficulties have the lowest employment rates in the United Kingdom compared to physical disabilities (Brown & Powell, 2018). The difference in employment rates between physical and other disabilities could be explained by the differences in visibility of the disability itself. For example, neurominority conditions (including mental health conditions and learning difficulties) are considered invisible or hidden

disabilities. Santuzzi et al. (2014) define hidden disabilities as “a wide range of physical and psychological conditions that often have no visible manifestation or have visible features that are not clearly connected to a disability” (p. 204). Therefore, based on this definition, ADHD can be considered as a hidden disability because difficulties and challenges are not visible nor have visible features. In the workplace, having a hidden disability is considered a challenge because it is the individual’s choice whether to disclose their disability. Yet they must disclose, according to the law, to be able to access support at work or even for entering work (Khan et al., 2019). Stigma is arguably the most influential contributor towards reasons to not disclose disabilities (Pearson et al., 2003)

Defining Stigma

Stigma was first defined as an act of discrediting another individual based on an attribute about them (Goffman, 1963). Throughout time stigma has adopted many variations linked to social expectations, judgements of interaction legitimacy, and stereotypical beliefs (Kurzban & Leary, 2001). As a result, theories relating to stigma are founded in social cognitive approaches and adopt a social constructivist perspective.

Research has explored three main types of stigma: public, self and courtesy (Mueller et al., 2012). Public stigma is public assumptions about a group usually formed by media representations and poor knowledge. Self-stigma is arguably a consequence of public stigma, where an individual who is stigmatized in society further internalises negative assumptions and expectations. Finally, courtesy stigma is related to the stigma that is projected onto those close to the individual who is stigmatized, most often the relatives. Stigma can significantly impact an individual’s self-esteem, well-being and act as a barrier to disclosure (Muller et al., 2012).

Stigma Related to ADHD

The two most stigmatised aspects of ADHD are the legitimacy of the diagnosis and the stigma surrounding medication for ADHD (Masuch et al., 2019). The inconsistency in the diagnostic criteria and the history of the diagnosis is arguably the reason for the associated stigma (Mueller et al., 2012). As mentioned, ADHD was considered a disorder that diminished in adolescence and only begun to be discussed as an adult disorder in the early 1990’s (Yavuz & Ogel, 2013). Since then, diagnostic criteria have changed at each release of the DSM focussing predominantly on altering the age of onset. Going back further, ADHD was defined as a deficit of moral control in an era where children were expected to behave as adults (Doyle, 2004; Lange et al., 2010). Overtime, the diagnosis is greatly related to society expectations of how individuals of any age should act (Erlandsson & Punzi, 2017). Taking the above

inconsistency in criteria and the changes across history, the legitimacy of ADHD as an existing or real disorder is the main contributor to the stigma associated with ADHD (Mueller et al., 2012). In measures of ADHD stigma, the aetiology and the norm-violating/externalising behaviour form two of six dimensions which are also linked to the legitimacy of the disorder (Fuermaier et al., 2012). Example items from this measure highlight these misconceptions such as *“Adults with ADHD are of lower social status”*, *“Extensive exposure to video games and TV shows can cause ADHD”*, and *“ADHD is invented by drug companies to make profit”*.

Stigma around Treatment. There is also stigma associated with the treatment of ADHD given that medication is also misused by those with and without ADHD as performance enhancing stimulants (McGough, 2016). This aspect of stigma is also observed in Fuermaier et al.’s (2012) measure of ADHD stigma in the items *“Many adults with ADHD exaggerate their symptoms in order to be medicated”*, *“under medication, adults with ADHD are less trustworthy”*, and *“Adults with ADHD misuse their medication (sell it to others, take too much...)”* (p. 5). These misconceptions have been associated with negatively impacting treatment adherence and perceived efficacy (Mueller et al., 2012).

Impact on Disclosure

Stigma associated with the diagnosis and treatment of ADHD has a negative impact on the social cognitive process underpinning the decision making of whether to disclose (Santuzzi et al., 2014). It is argued that individuals weigh up the costs and benefits of whether to disclose with stigmatization being a cost of disclosure (Katz, 2003). The most commonly reported cost among employees with disabilities is the fear that they will not be hired and anxiety about negative co-worker reactions (Johnson & Joshi, 2016; Khan et al., 2019; Schur et al., 2014). These fears are not unjust with evidence suggesting that disclosure is associated with a lower likelihood to hire (Fabiano et al., 2018; Pearson et al., 2003). Every individual deciding whether to disclose their ADHD to their employer has two identities to manage, their work identity and their identity as someone with ADHD (Chaudoir & Fisher, 2010). A consequence of stigma is that it is a threat to one’s work or social status (Mueller et al., 2012). Therefore, adults with ADHD may not disclose to avoid these negative consequences. However, non-disclosure means that the individual is concealing an identity which is associated with negative work-related outcomes, for example: poorer performance and wellbeing, challenges with co-workers, and tiredness from the cognitive and physical effort required to conceal the identity (Chaudoir & Fisher, 2010; Santuzzi & Waltz, 2016). It is often assumed that disclosure leads to positive outcomes like work well-

being and improved performance but there is a lack of published research investigating whether this is actually the case (von Schrader et al., 2014).

Summary

It is clear that the context is essential to understanding what makes an effective reasonable adjustment. From the range of aspects discussed in this chapter (i.e. reasonable adjustments, contextual constraints like disclosure, and gatekeepers of the decision-making process) any synthesis of work-related literature will involve collating evidence from multiple disciplines. Therefore, an amalgamation of research evidence is required to better understand the work-related challenges and interventions for adults with ADHD.

Chapter 3 A rapid evidence assessment of adult ADHD assessments documented in the literature

Chapter Three addresses the first aim of the thesis by acquiring and appraising the existing measures of adult ADHD to identify any workplace challenges or strengths documented in them. Examining how adult ADHD is assessed and whether any measures involve the workplace will further contribute to any intervention designs. Controversy about the diagnosis of ADHD in adults also highlight the need to review the assessment criteria and measures used for diagnostic assessments. Since ADHD was first diagnosed in children, there has been a debate as to whether it diminishes in adolescence (Lange et al., 2010). This debate is related to whether ADHD is genetic and whether it impacts the lifespan and these mis-conceptualisations have led to ADHD being misconstrued as a childhood or even mental health condition (Robbins, 2017). More recent discussions suggest that there may also be an adult onset of ADHD (Asherson & Agnew-Blais, 2019; Faraone & Biederman, 2016). At present, the DSM-V criteria states that the symptoms must be present prior to the age of 12 which was adjusted from seven years old in the fourth version (Epstein & Weiss, 2012). Arguably, researchers and practitioners are still learning about adult ADHD and rely heavily on the experiences of children (Weisler & Goodman, 2008). There have since been calls to re-evaluate these criteria to include emotional and social features of ADHD that become more prominent during adulthood such as challenges with social interactions (Bell, 2010).

One such contextual social and emotional experience that is unique to adults is the workplace (Weisler & Goodman, 2008). Given that adults with ADHD also appear disadvantaged in terms of work and career outcomes, little information is known about whether existing assessments for adult ADHD specifically address experiences associated with the workplace. A previous systematic review of assessments for ADHD identified 14 scales yet rated the majority of 35 relevant studies as poor quality because of insufficient detail (Taylor et al., 2011). Conner's Rating Scale and Wender Utah's Rating scales were deemed the most robust regarding reliability and validity (Taylor et al., 2011). I was unable to find any systematic reviews that have been conducted since that include assessments published after the DSM-V was released in 2013, furthermore, none of the existing reviews referred to the workplace (Adler & Cohen, 2004; Kooij et al., 2008; Taylor, et al., 2011). Therefore, demonstrating an urgent need to review the evidence on ADHD assessments and their relevance to the adult-specific context of work drawing on established frameworks.

Psychological assessments should be evaluated comparing the validity, reliability, and applicability of each assessment (Constantine & Ponterotto, 2006) as evident in frameworks developed by, for example, the British Psychological Society (BPS) who use the European Federation of Psychological Association (EFPA) review model, or the Mental Measurements Yearbook's specific criteria (Buros Center For Testing, 2019; EFPA, 2013). Yet, extant reviews on ADHD assessments or reviews of assessments for other neurodevelopmental conditions such as autism do not use a framework to evaluate the assessments, and none include an amalgamation of both psychometric and diagnostic properties (Falkmer et al., 2013; McConachie et al., 2015). Therefore, to ensure robustness and consistency when reviewing assessments, the development of an evaluative framework is the necessary starting point.

Psychometric Properties of Assessments

Fundamentally, all psychometric assessments must be both reliable and valid (Coaley, 2009b). Reliability is twofold and refers to a) the consistency of the assessment providing the same result for the same individual across multiple time points and situations, and, b) the consistency of the items within the measure (Koczwara & Ashworth, 2013). There are various methods applied to examine whether an assessment is reliable. Consistency across time points is typically measured by test retest or TRT, TRT compares results the same individual at two time points, the more similar they are, the more reliable the assessment (Epstein & Kollins, 2006). Internal consistency addresses how well the items in the assessment reflect the construct (Clark & Watson, 1995). It is commonly measured using Cronbach's alpha which looks for a high relationship between items, the higher the relationship, the more likely they are to be measuring the same construct (Cronbach, 1988). A third method is inter-rater agreement which has been applied in a range of ways and looks at how much of an agreement there is between two separate raters (Craig et al., 1995; McHugh, 2012). For assessments of ADHD inter-rater reliability is often measured as a comparison between self-reported symptoms and clinician rated symptoms (Magnússon et al., 2006). They also compare ratings from significant others which can be family members, spouses or work colleagues (Barkley, 2011).

Validity coefficients estimate to what extent the assessment measures what it was designed to measure, here being ADHD (Coaley, 2009b). There are different forms of validity including how a measurement is developed and is related to outcomes of interest (construct, convergent, and content validity) and others are related to how the scale is received by the people undergoing the assessment (face and faith validity) (Koczwara & Ashworth, 2013). Construct validity is a term that encompasses the various forms and can include evaluations regarding whether the assessment is

developed from theoretical grounds or conceptualisations (Shepard, 1993). Content validity is defined as an examination of whether the assessment is fully representative of what it aims to measure (Almanasreh et al., 2019). For example, for ADHD it would need to assess every challenge associated with ADHD to fully represent ADHD as a construct. Convergent validity compares the new assessment with one that already exists to see whether it measures the same construct or gets similar results (Carlson & Herdman, 2012). Finally, predictive validity is whether the assessment can be applied to predict certain outcomes for example it is well established that cognitive ability highly predicts job performance (Robertson & Smith, 2001).

Compared to the impact of poor reliability and validity in psychometric assessments the impact of a poor diagnostic scale carries higher risks because of the danger of being prescribed the wrong medication based on an inaccurate assessment (Botello et al., 2016). As a consequence, diagnostic assessments have a separate set of evaluation criteria that reflects the medical implications of diagnosis.

Diagnostic Properties of Assessments

Diagnostic assessments are evaluated against both their sensitivity and their specificity reported as percentages (Falkmer et al., 2013). Sensitivity is how many true positives (those with ADHD being identified as having ADHD) are identified by the assessment (Altman & Bland, 1994). Conversely, specificity looks at true negatives (those without ADHD being identified as not having ADHD). The ideal assessment would have both high sensitivity and high specificity (Lalkhen & McCluskey, 2008). In addition to percentages, there is also the negative and positive likelihood ratio, the negative and positive predicted value, and the pre-test probability (Gleason et al., 2010; Lalkhen & McCluskey, 2008). These reflect the comparisons between the sensitivity and specificity as well as the predictiveness of the assessment (Gleason et al., 2010). The AUC or area under curve value is a combination of the above measures that weighs both sensitivity and specificity in equal measures (Hand, 2010). In sum, the methods of evaluating assessments vary greatly between psychometric and diagnostic forms. A final difference is related to the standardisation of the assessments. In psychometrics, assessment data are compared to a norm group which usually consists of a large sample of individuals who have taken the assessment prior (Murphy & Davidshofer, 1988). For diagnostic assessments, the results are usually compared to a sample of individuals with and without the condition being examined (Cicchetti, 1994).

Research Aims and Questions

Chapter Three aims to develop a framework for evaluating measures of adult ADHD and evaluate any measures related to the workplace including any items that describe specific challenges. Findings from this chapter contribute to the first thesis

aim to acquire and appraise existing evidence associated with workplace challenges and support for adults with ADHD which will inevitably support the design and evaluation of any interventions to support those with ADHD at work.

The specific questions addressed in Chapter Three are:

What are the existing adult ADHD assessments?

- a) How were they developed? Is there a theoretical framework?
- b) What symptoms or outcomes do they address?
- c) Which interventions are they related to, if any?
- d) What are the mechanisms involved in administering them? Is there a standardised protocol?
- e) What is their reliability- which data is available?
- f) What is their validity- which data is available?
- g) To what extent are they standardised (e.g. norm groups)?
- h) Do any measure the extent of workplace challenges, strengths or outcomes?

Method

Rapid Evidence Assessment

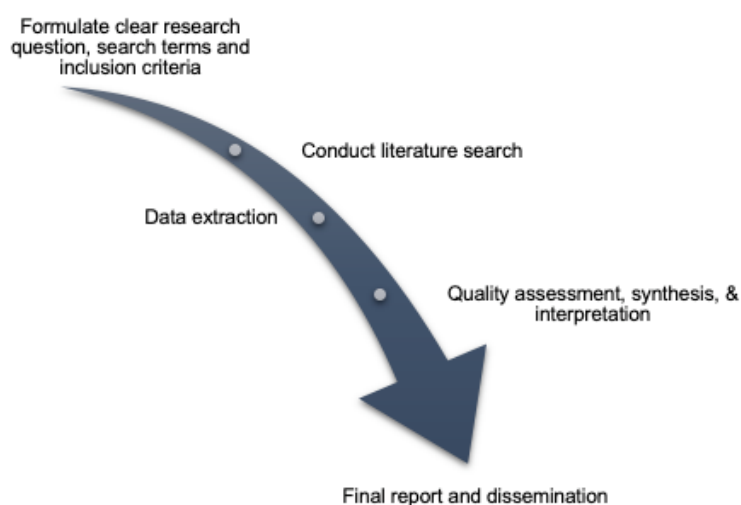
A rapid evidence assessment (REA) adopts a similar method to a systematic review as a rigorous and evidence-based way of synthesising the literature aiming to minimise bias (Crawford et al., 2015) but acknowledges any time constraints and limited resources when conducting searches and extracting data (Underwood et al., 2007). REA methodology enables researchers to make quick practical suggestions of what interventions work best based on the evidence available and it has great applicability from research to practice (Khangura et al., 2012). REA is applied in this study to gain a quick summary of the existing conceptualisations for adult ADHD prior to examining the evidence for related interventions.

In organisational psychology, there is published guidance on how best to conduct a REA which has been adopted in the present study (Barends et al., 2017). The data extraction process is limited to identify key elements related to the research question, providing an overview of adult ADHD assessments rather than detail about each study (Ganann et al., 2010). The appraisal of quality is limited to the overall methodological appropriateness rather than other aspects of quality and a rating scale was developed to adhere to this which is discussed in more detail below (Varker et al., 2015).

The process of the REA is as follows; initially a research question is formulated alongside search terms and inclusion criteria (Crawford et al., 2015). This step is followed by a literature search in which the criteria narrows the literature to the included studies. Data are then extracted from each study including an assessment of the quality of the study. All the data extracted from the literature are synthesised into clear findings and used to produce a final report which is disseminated once complete. Figure 3.1 depicts an adapted version of the steps required identified by Crawford and co-authors in 2015.

Figure 3.1

Basic steps of rapid evidence assessment



Note. Adapted from “Rapid Evidence Assessment of the Literature (REAL©): streamlining the systematic review process and creating utility for evidence-based health care” by C. Crawford, C. Boyd, S Jain, R. Khorsan, and W. Jonas, 2015, *BMC Research notes* (<https://doi.org/10.1186/s13104-015-1604-z>).

Inclusion Criteria

The inclusion criteria for each study was as follows: a) studies had to evaluate the validity or reliability of an ADHD assessment or outline the development of one, b) any assessment must be specific to ADHD, c) adult samples with a primary diagnosis of ADHD (rather than a co-occurring one). If the full text was unavailable it was excluded. No restrictions were placed on date, but articles did have to be written in the English language.

Search

Two methods of searching were used to identify any assessments of ADHD that can be used on adult populations. The first was a general search of the PsychTests which is a database that includes a wide range of psychological tests that have been validated and administered. The second was to search other relevant databases for

articles on validity or reliability, see Table 2.2 for a list of databases searched. Once the assessments were identified a search for the available technical manual or general information about the administration of the assessments was conducted using the Google search engine and the details from the most recent systematic review (Taylor et al., 2011).

Search Terms. The search terms are displayed in Table 3.1. The terms were limited to the title and abstract in an attempt to gather only the most relevant articles from the searches and to reduce the time spent screening.

Table 3.1

Search terms for rapid evidence assessment

Search terms	
<i>TITLE</i>	<i>"Adult ADHD" OR "Adult ADD" OR "adult attention deficit hyperactivity disorder" OR "adult attention deficit disorder"</i>
	<i>AND</i>
<i>TITLE</i>	<i>scale OR test OR questionnaire OR assessment OR measure OR inventory OR instrument</i>
	<i>AND</i>
<i>ABSTRACT</i>	<i>Valid* OR reliab* OR develop*</i>

Databases. As mentioned in the introduction chapter adult ADHD is conceptualised differently across disciplines. Therefore, the databases searched comprised key journals from the medical, psychological and cognitive assessment fields, including one based on business research consistent with the CEBMA guidelines (Barends et al., 2017). The two large databases searched were EBSCOhost and SCOPUS. More detail regarding the databases and journals searched can be viewed in Table 3.2.

Table 3.2

List of databases searched in the REA

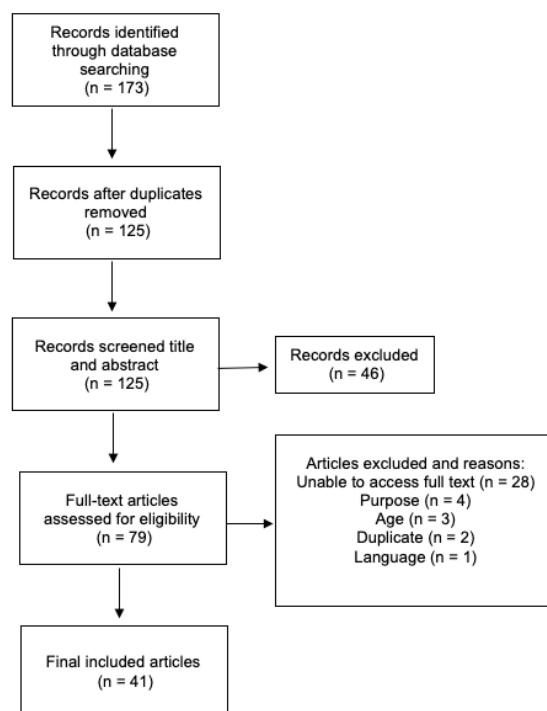
Main database	Specific databases/journals
EBSCOhost	MEDLINE, Academic Search Complete, Business Source Premier, APA PsycArticles, APA PsycTests
Scopus	ADHD-related journals, medical and science databases

Study Selection

Search results and subsequent screening was managed using the EPPI Centre Reviewer software (Thomas et al., 2010). One reviewer screened records at the title and abstract and the full-text stage. A total of 125 records were screened at the title and abstract stage which still included a large proportion of duplicates, see Figure 3.2 for the PRISMA diagram. A total of 28 articles were unavailable to screen at the full-text stage so were excluded. Data were extracted from a final set of 41 articles.

Figure 3.2

PRISMA diagram



Data Extraction

An evaluative framework was developed specifically for this study that could evaluate assessments using both diagnostic and psychometric criteria. The framework was adapted from existing criteria (Buros Center For Testing, 2019; EFPA, 2013). The framework has six categories namely, 1) development, 2) delivery, 3) reliability, 4) validity, 5) study quality and 6) work related aspects. The development section included questions about how the scale was developed: whether it included any theoretical concepts, the items, details about standardisation, symptoms it intended to measure including outcomes, and whether it was associated with a particular intervention. The delivery section included details about how the assessment is administered (length, recipient and standardised protocol) as well as how it is scored, how these scores are reported, and the accessibility of the assessment. Accessibility was linked to languages- whether the assessment was translated and whether the language used was ambiguous. Language of the response options has been criticised in previous research as being ambiguous in assessments for ADHD (Freedman & Honkasilta, 2017). For example, the word *often* in “*how often does this symptom occur*” has different meanings across people and contexts so by definition is ambiguous and may result in inconsistent responses (Cohen, 2006; Taylor et al., 2011).

Critical Appraisal

In a REA, study quality is addressed by assessing the methodological appropriateness (Varker et al., 2015). To evaluate study quality, I developed a short rating scale which focused on aspects including appropriateness of sample and control group. The scale was adapted from the existing EFPA rating scale which was designed to evaluate intervention studies rather than ones assessing validity (EFPA, 2013). Similar to the EFPA rating scale studies associated with the assessments were individually rated from 0-4 with 0 = *insufficient information to rate*, 1 = *inadequate*, 2 = *adequate*, 3 = *good*, and 4 = *excellent*. A total score indicated whether the study was rated with high, medium or low quality.

In sum, the majority of studies were rated with medium quality because the methods were appropriate to answer the research question and the selection criteria was adequately explained. Unlike prior review findings, most studies included a representative population as assessments designed to be applied in clinical contexts were validated using a clinical sample (Taylor et al., 2011). Studies that were rated high scored good-excellent on nearly all the criteria (Alexander & Liljequist, 2013; Christiansen et al., 2012; Kessler et al., 2005; Spencer et al., 2010b; Young, 2004). Although some of these studies, and those rated low-medium quality, tended to score

higher on risk of bias because they were authored by the assessment development team. Rating for each study is displayed in Table 3.3.

Table 3.3*Assessment title, variations, and relevant articles identified in the REA*

Assessment title	Variations	Articles	
ADHD Symptom Infrequency Scale (ASIS)		Courrégé (2019)**	
Adult ADHD Investigator Symptom Rating Scale (AISRS)		Spencer (2010 ^o ;10***)	
Adult ADHD Quality of Life Scale (AAQoL)		Brod (2005 ^o ;06**;15**) Gjervan (2010)* Mattos (2011**;11**) Matza (2007)**	
Adult ADHD Screening Inventory (IR-ADHD)		Bacciotti (2019)**	
Adult ADHD Self Report Scale (ASRS)	Screeener (v1.1)	Castagna (2019) ^o Gray (2014)** Heo (2018)** Hilnes (2012)** Kessler (2005 ^o ;05***;07**) Kiatrungrit (2017)**	Kim (2013)** Silverstein (2018)** Somma (2019) ^o Takeda (2017)** Ustun (2017)** Yeh (2008)**
Adult Attention Deficit Hyperactivity Disorder Rating Scale (ADHD-RS)		Richarte (2017)**	

Barkley Adult ADHD Rating Scale (BAARS-IV)		Barkley (2011) ^o Lynch (2018)**	
Conners' adult ADHD rating scale (CAARS)	Self-report short version	Alexander (2016)***	Harrison (2019)**
	Self-report long version	Amador-Campos (2014)**	Kooji (2013)**
	Observer-report short version	Christiansen (2010***;11**)	Primus (2014)*
	Observer-report long version	Ghassemi (2010)*	Someki (2019)**
Quantified Behaviour Test Plus (QBT)		Edebol (2013)**	
Symptoms Checklist 90 (SCL-90-R)		Eich (2012)**	
Wender-Reimherr Adult Attention Deficit Hyperactivity Disorder Scale (WRAADS)		Marchant (2013)**	
Young ADHD Questionnaire (YAQ)	Self-report (YAQ-S) Informant report (YAQ-I)	Young (2004)***	

Note. ^o indicates a listing on PsycTests rather than a study. ***, **, * indicates high, medium, and low-quality study, respectively.

Results

The results are structured in accordance with the REA questions. An overview of the assessments and the studies identified is provided followed by discussion of the scale development, symptoms and outcomes addressed, related interventions, standardisation, translations, mechanisms, reliability, validity, and diagnostic properties, and the work-related challenges identified.

Overview

A total of 12 adult ADHD assessments were identified from the included studies. Their names and associated articles are displayed in Table 3.3. There were seven assessments that addressed the combined symptoms of ADHD whereas other assessed the functioning (health outcomes), feigning of symptoms, and attention. The assessments and their purpose, variations, items, languages, scoring, administration, and reporting can be found in Table 3.4. Nearly all the scales required self-reporting of symptoms with only one aiming to take an objective measure of attention (the QBT).

Table 3.4*Assessment name with year, purpose, variations, items, languages, scoring, administration, and reporting*

Assessment (year first published)	Purpose	Versions (Items)/Items	Languages	Scoring	Administration	Reporting
AAQoL (2005)	Evaluate clinical trials (can be used in research)	29	English, Norwegian, Portuguese	Sum subscales & total (MID)	Use by researchers and clinicians	Clinician
ADHD-RS (1998)	Clinical	18	English, Spanish	Sum subscales & total, converted to percentile	Self-report but with assistance from clinician or family member	Clinician
AISRS (2010)	Clinical (can be used for research/teaching)	18	English	Sum subscales & total	Clinician	Clinician
ASIS (2019)	Identifying feigning	52	English	Total score of infrequency items	Self-report	Clinician
ASRS (2005)	Screening	Long version (18) Short version (6)	Chinese, Korean, Japanese, Thai & Italian	Shaded area indicates possible symptoms	Self-report, 5 minutes	Health care professional (can recommend for further assessment based on score)
BAARS-IV (2011)	Screening, Clinical	Current symptoms (27) Childhood symptoms	English	Sum subscale & total, compare scores to norm group	Self-report and informant long version 5-7 minutes, short version 3-5 minutes	Clinician

		Screening (9)			Use by clinicians	
CAARS (1999)	Multiple	Short version Long version Screening version	English, Catalan, German & Japanese	Raw & T-scores	Self-report between 10-15 minutes Observer- similar Use by clinicians	Electronic report generated but interpreted by clinician
IR-ADHD (2019)	Screening	85	English	Sum subscale & total	Self-report, 20 minutes	Clinician
QBT	Assess attention, activity & impulsivity	QBTest QBCheck		Graphs compared to control group without ADHD	Available online, requires a computer, 15-20 minutes	Available on the software called QAT, can only be interpreted by trained medical professional
SCL-90-R (2012)	Clinical	9	English, German	Sum of total	Self-report with clinical assistance	Full version available electronic report, clinician
WRAADS (1995)	Clinical	28	English, German	Sum subscale & total	Self-report and informant	Clinician
YAQ (2004)	Clinical	112	English	Sum subscale	Self-report and informant	Clinician

Note. MID= minimally important difference.

Assessment Development

The majority of the assessments (CAARS, IR-ADHD, ASRS, ADHD-RS, and AISRS) relied on the DSM-IV criteria as a theoretical framework. Although there were two assessments published after the DSM-V was released, neither conceptualised ADHD differently. Other measures which did not use the DSM as a theoretical framework included aspects of ADHD such as emotion regulation but still conceptualised ADHD in terms of inattention and hyperactivity/impulsivity (SCL-90-R, WRAADS, YAQ). In addition, some assessments are adaptations of the childhood versions (QBT and ADHD-RS). Therefore, the rationale as to why the assessments were developed if they do not add to the existing measures is unclear (Boateng et al., 2018).

The methods of validating the measures varied. Eight assessments involved a factor analysis to select the items that load best onto the construct (Boateng et al., 2018). An alternate method involved administering the assessment to those with and without an ADHD diagnosis to select items which predicted a diagnosis (Courrégé et al., 2019). Only one assessment, the AAQoL, was deemed to follow the full nine steps of best practice by developing their items from their own conceptual model of the quality of life outcomes and how these related to the challenges associated with ADHD (Boateng et al., 2018).

All assessments were developed for use in clinical settings for either screening or evaluating clinical trials. One assessment measured whether symptoms were being faked (ASIS) and because of this purpose, there was limited information provided in the study regarding items and development (Courrégé et al., 2019). The applicability of the assessments beyond the clinical context was unclear while some assessments did mention they could be used for research purposes (AISRS and CAARS). Finally, none of the assessments could be used to singly identify adult ADHD, those used in clinical settings as part of the diagnostic process were used at the beginning for screening and accompanied a comprehensive assessment of the person's history and experiences which is consistent with medical advice (Weisler & Goodman, 2008).

In sum, there is a strong reliance on the medical model of ADHD with assessments adopting the DSM description of adult ADHD, samples selected from clinical setting and language use of "suffer", "disease", and "healthy controls" in the articles (Sjöberg & Dahlbeck, 2017).

Symptoms and Outcomes

As previously mentioned, most of the assessments were developed from the DSM criteria which identifies adult ADHD as having core symptoms of inattention and

hyperactivity/impulsivity. In the earlier assessments specifically CAARS and WRAADS symptoms such as emotional challenges, problems with self-concept, and temper were included. The WRAADS uses the Utah criteria as a basis for item development which argues to measure adult rather than child symptoms (Voelker, 1998). The YAQ addressed the recommendations to include an emotional element since the CAARS and WRAADS was published (Young, 2004). There has however been an inclusion of the social aspect of adult ADHD in the assessments measuring functioning: AAQoL and YAQ, both include relationships and social functioning as subscales. Therefore, difficulties with social interaction seem to be acknowledged as an outcome rather than a symptom. Memory is yet to be considered in the assessments identified.

A further gap in the development of the assessments was that the validation studies neglected demographic differences and how they impact the validity of the assessments. Some highlighted differences in gender in the *problem with self-concept* subscale of the CAARS although this was not investigated further and instead has resulted in the use of different norm groups which is contrary to recommended best practice in psychometrics (Amador-Campos et al., 2016; Christiansen et al., 2011; Macey, 2003; Someki et al., 2019). Differences in age were not explored in studies either despite one study validating the IR-ADHD assessment on a student sample (Bacciotti & Carvalho, 2019).

Interventions

Three assessments (AAQoL, AISRS and SCL-90-R) explicitly stated that they were developed to be used in assessing the efficacy of interventions, namely medical treatments. These were the only interventions or treatments referred to in the studies emphasising again the dominance of the medical model.

Standardisation

Information related to how assessments were standardised could be extracted from four assessments. Samples for standardisation differed according to the assessments purpose. Those that were developed for diagnostic purposes were standardised using a control group of individuals without ADHD. Assessments that aimed to screen for ADHD or the severity were compared to prevalence rates in the general population.

Translations

Four of the assessments had studies which identified translated versions of the assessments. There were three translation studies associated with CAARS- Catalan, German and Japanese (Amador-Campos et al., 2016; Christiansen et al., 2011; Someki et al., 2019). Four studies for ASRS including Chinese, Italian, Korean and

Thai translations (Heo et al., 2018; Kiatrungrit et al., 2017; Somma et al., 2019; Yeh et al., 2008). The WRAADS had one study using a German version (Retz-Junginger et al., 2017) and ADHD-RS had been translated into Spanish (Richarte et al., 2017). The focus in these studies was the reliability and validity of the translated assessments, complexities around the contextual definition of ADHD was instead neglected.

The range in translations indicate the presentation of ADHD is perceived to be similar across cultures. Within the studies themselves, none discussed the process of translation- back translations etc which suggest a lack of use of robust methods to ensure the translations are accurate (Boateng et al., 2018). Cross-cultural differences in ADHD is also absent from the articles (Bauermeister et al., 2010).

Mechanisms

Mechanisms relates to the a) administration, b) accessibility, c) scoring, and d) reporting of assessments. Of the 12 assessments, seven were administered by self-report, whereas five required a clinician to complete the assessment based on their medical impressions of the individual. To examine whether symptoms are present in childhood of the self-report assessments include an identical version for an informant to complete (BAARS IV, CAARS, WRAADS, and YAQ). The informant is typically a partner, close family member, or friend.

The accessibility of the assessments is especially important for adult ADHD (Kovshoff et al., 2012). Firstly, due to the distractibility, poor working memory and difficulties with attention regulation consistent with a diagnosis of ADHD it is imperative that the assessment can be completed in a short amount of time (Hines et al., 2012). The number of items in the self-report assessments ranged from 6 (ASRS short version) to 112 (YAQ) and estimated to take between 3 and 30 minutes to complete (BAARS IV short version and IR-ADHD). In the present study, assessments were identified to include 'how often' as part of the response indicating that previous recommendations have not been considered (Taylor et al., 2011).

A third aspect of accessibility is whether the assessment is available electronically or utilises technology as part of the scoring or administration. Adopting a technological approach to assessments reduces waiting times and saves on costs (Mirage, 2020). The QBTest was the only assessment that collected an objective measure of attention through the use of technology. Screening assessments such as the ASRS and the ADHD-RS are available electronically and can be scored online. There were some assessments which were as open access (BAARS, CAARS and, ASIS) including the technical manuals.

The methods for scoring the assessments were similar where a clinician sums the scores for the subscales and then calculates a total score. These are then compared to a control or norm group and interpreted by a medical health professional. No standardised protocols for administering assessments and interpreting results were identified. It is assumed that clinicians will follow best practice guidelines in interpreting the scores holistically with other information when considering diagnosis or appropriate treatment (Weisler & Goodman, 2008). Recommendations for missing scores were included for two assessments (AISRS and AAQoL) suggesting that a certain number would impact the accuracy (Brod et al., 2006; Spencer et al., 2010).

Psychometric assessment guidance highlights the importance of reporting results in an ethical and informed manner (Coaley, 2009a). Information for reporting the scores of the assessments identified in the REA was limited. Cut off scores and advice for treatment was provided for ASRS, SCL-90-R, and ADHD-RS but there was no specific advice to clinicians.

Reliability, Validity, and Diagnostic Properties

Table 3.5 provides an overview of the reported scores extracted from the studies on internal consistency, test-retest reliability, inter-rater reliability, construct validity, sensitivity, specificity, and the area under curve for all assessments.

Assessments evaluated for internal consistency (Cronbach's alpha) and factor loadings adequate to good levels of reliability (Christiansen et al., 2011; Eich et al., 2012; Kiatrungrit et al., 2017; Kim, Lee, & Joung, 2013; Spencer et al., 2010b; Young, 2004). As expected from the DSM conceptualisation core symptoms loaded onto two dimensions, inattention and hyperactivity/impulsivity (Kessler et al., 2007; Spencer et al., 2010b).

Test re-test reliability was measured for four assessments (AISRS, ASRS, CAARS and SCL-90-R) and showed adequate to good levels ranging from $r = .41-.96$ (Amador-Campos et al., 2016; Christiansen et al., 2010; Eich et al., 2012; Gray et al., 2014; Spencer et al., 2010b). In these studies, scores were only expected to change within a reasonable range. The time between the two tests ranged from 2 weeks to 30 years. One study found that the TRT between one-year intervals was good but was poorer across the life span (Eich et al., 2012). Poor TRT scores were explained to be a result of measurement error rather than true score differences (Kessler et al., 2007; Spencer et al., 2010b).

Assessments designed for screening were evaluated against their specificity and sensitivity. Specificity was high for all assessments but the SCL-90-R (54%), with the lowest and highest scores for the ASRS ranging between 74% and 99% for the

ASRS (Van Voorhees et al., 2011). Sensitivity was slightly lower with the lowest being 61% for CAARS and the highest being 88% for ASIS. Some scales had been examined from both a psychometric and diagnostic point of view (ADHD-RS, ASIS, ASRS, CAARS, and SCL-90-R). These scales had more detailed reports of their development and had the most studies assessing their properties.

A total of four assessments had both self-report and informant versions. Of the four, two were assessed for inter-rater reliability (CAARS and WRAADS). CAARS ranged from poor to moderate ($r = .27-.59$) and WRAADS was high at $r = .75$. The poor correlations related to the CAARS self and observer assessment were noted at the inattentive DSM VI symptoms ($r = .27$) and the impulsivity and emotional lability ($r = .28$) subscales and were from a Japanese sample (Someki et al., 2019). There is limited explanation as to why these correlations are low but there is an argument in the literature that specific subscales including inattention and emotion rely on a more internal cognitive experience in adults which may not be understood by an observer (Van Voorhees et al., 2011). Examples of convergent validity identified weaker correlations due to subscales of ADHD being compared to depression (BDI) and anxiety scales (STAI). Assessments related to symptomatology were usually compared to one another whereas those related to functioning were compared to scales such as the CGI. Correlations associated with symptoms tended to be higher than those related to functioning because there are discrepancies when comparing self-reported to clinician rated functioning (Matza et al., 2007). There was no information available on the validity of the ADHD-RS, IR-ADHD, QBT, and YAQ demonstrating a gap in research and practice.

Table 3.5*Psychometric and diagnostic properties of the assessments*

Scale	Psychometric properties				Diagnostic properties		
	Internal consistency (α)	Test re-test (r)	Inter-rater (r)	Construct validity (r)	Sensitivity (%)	Specificity (%)	AUC
AAQoL	.56-.93	-	-	.28-.72	-	-	-
ADHD-RS	.88	-	-	-	82	75	89
AISRS	.59-.95	.90	-	.37-.88	-	-	-
ASIS	.96	-	-	.49-.92	68-88	85-89	-
ASRS	.54-.96	.43-.85	.47	.37-.78	63-71	74-99.5	62-95
BAARS-IV	-	-	-	-	-	-	-
CAARS	.74-.95	.64-.92	.27-.59	.29-.66	61.2-78.8	83.4-88	
IR-ADHD	.96-.97	-	-	-	-	-	-
QBT	-	-	-	-	86	83	-

SCL-90-R	.83-.88	.41-.84	-	.50-.66	75	54	-
WRAADS	.78	.96	.75	.50-.60	-	-	-
YAQ	.50-.98	-	-	-	-	-	-

Work-relevant features of the ADHD assessments

Both symptoms and outcomes in each of the assessments were examined to identify any that were related to the workplace. The outcomes relevant to the workplace included poor time management, productivity, and organization with items such as *“difficulty completing projects and tasks”*, *“how often do you have difficulty getting things in order when you have to do a task that requires organization?”*, and *“when doing my work I am unable to concentrate on details or commit errors due to lack of care”*. No assessments measured solely work-related outcomes, the AAQoL includes a subscale of productivity where lower scores indicate impaired functioning at work. With work being an influential context in the DSM diagnostic criteria, whereby the symptoms must be present in two settings (home and work) for a diagnosis, these findings emphasise a gap in knowledge.

Discussion

The REA identified 12 existing adult ADHD assessments from 41 studies. Theoretical frameworks for most assessments were formed from the DSM diagnostic criteria with symptoms of inattention, hyperactivity and impulsivity. Focus on these symptoms is contrary to recommendations to widen symptoms to include emotional and social aspects unique to adulthood, especially as a limitation of the DSM criteria is that it is adapted from childhood ADHD symptomatology (Van Voorhees et al., 2011). Most of the articles (33%) identified in this study were evaluating the WHO ASRS assessment which is recommended as the global assessment to use for screening. A total of three assessments were designed to be applied in medical interventions. For a formal diagnosis, the assessments are recommended to accompany a diagnostic interview which is argued to be necessary to explore the persons history and aspects of interpersonal relationships or self-concept (Weisler & Goodman, 2008). Therefore, the theoretical frameworks, the symptoms, the associated interventions and the lack of standardised protocols for administration emphasise the dominance of the medicalised approach to diagnosis and treatment of ADHD and a gap in the practical applications of the assessments.

The psychometric properties of the 12 assessments varied with many reporting adequate to high levels of internal consistency and test retest reliability. Although it was identified that test retest reliability decreases over time. The diagnostic properties were reported for six of the assessments indicating good sensitivity and specificity. The validity of four assessments was not reported. Information regarding standardisation of the assessments is limited. If the assessment was designed for medical purposes validation studies compared assessment scores from those with ADHD to a control

group without ADHD. If the assessment was designed for screening, the frequency of those with an increased likelihood of having ADHD was compared to prevalence rates. Finally, assessments focused more on the outcomes associated with adult ADHD and identified that the core symptoms impact the workplace through poor productivity, time management, and organisation. None of the assessments identified assessed strengths associated with ADHD.

Limitations

A limitation of the present REA is that the limited inclusion and search criteria meant some well-known assessments for adult ADHD were not included, in particular, Brown's executive functioning model and Copeland's symptom checklist (Brown, 2006; Gentile et al., 2006). In addition, full screening was conducted by one reviewer (although criteria were established in consultation) which meant that there is a risk of bias, especially in the judgement of study quality. Inaccessibility to full text versions meant that 28 studies were not included in the analysis (Barends et al., 2017). It is a suggestion for future research to extend this REA and include a wider range of measures and primary sources where possible.

Implication for Future Research and Practice

Future research could apply the evaluation framework to assessments that measure other forms of neurodivergence. It is evident from the findings that standardised protocols for administering assessments are needed because both knowledge and experience of ADHD vary across medical professionals and these are relied upon for interpreting and scoring assessments (Claggett, 2003). Assessments should also be made available for research use to reduce the risk of bias. Both research and practice need to acknowledge the challenges and strengths faced by adults with ADHD in the context of the workplace.

Conclusion

Most assessments conceptualised adult ADHD through a medical model of disability and were designed to be administered and interpreted by a medical professional and used in medical contexts. Most of the assessments were based on the core symptoms of inattention, hyperactivity, and impulsivity despite calls in the research to expand the conceptualisations to include social and emotional aspects. Furthermore, the core symptoms are based on childhood conceptualisations of ADHD. Although no assessment was designed solely for the workplace context, challenges associated with the workplace included poorer time management, organisation, and productivity. These challenges highlight a need to support adults in the workplace with

ADHD because of the negative implications of these challenges on workplace performance and wellbeing. There were no strengths identified in the assessments indicating an area for expansion in assessment development and validation. The lack of advancements in assessments limit the opportunity for intervention research to use psychometrically and diagnostic sound measures for evaluation.

Chapter 4 A realist systematic review of the existing interventions in the literature aiming to support adults with ADHD: method, outcomes and effectiveness

Workplace challenges associated with ADHD discussed in the first three chapters demonstrate a need for appropriate workplace support. There is also limited research that examines interventions from multiple disciplines. To address this gap, I conducted a systematic review of the documented interventions adopting a realist evaluation approach. Prior systematic reviews synthesising literature on any support for ADHD have neglected to search organizational and management literature and not investigated any impact on workplace outcomes. Therefore, the present study addresses the first thesis aim to acquire and appraise the interventions associated with ADHD to identify any that include aspects relevant to the workplace. These aspects may include workplace contexts, outcomes or mechanisms applicable to workplace interventions which are relevant to a realist evaluation framework.

Rationale for a Systematic Review on Adult ADHD and Relevant Interventions

As discussed in Chapter Two there are two main forms of controversy that are specifically related to ADHD: a) whether it is a legitimate diagnosis, and b) whether it should be treated with stimulants (Currie et al., 2014; Wilens et al., 2008). The controversies have led to misinformation about ADHD and has contributed to the associated stigma, yet little is known about how these controversies have impacted the literature, especially the interventions available to support adult ADHD. Systematic reviews aim to evaluate the literature in a non-biased way and are defined as “a review of research literature using systematic and explicit, accountable methods” (Gough et al., 2012, p. 5). Although the method originated in the medical field, over time, systematic reviews have taken hold in other domains of practice, such as social science, criminology, and psychology. They have become influential in policy development and are argued to have helped bridge the gap between research and practice across disciplines (Denyer & Tranfield, 2009; Rojon et al., in press). Therefore, the methodology allows for synthesis of literature across multiple domains which is reflective of the research and understanding of ADHD.

Realist Evaluation, Systematic Reviews and Organisational Research

Systematic reviews take a step-wise and transparent approach (Haddaway et al., 2015). A popular framework for synthesising research, developed in the medical disciplines, is the PICO framework. PICO stipulates that reviews should consider the patients or people being studied (P), the intervention itself (I), the comparator which

usually represents another intervention (C), and the outcomes or effects of the intervention (O) (Melnyk & Fineout-Overholt, 2011).

Due to the variety of methodological approaches in organisational research, the sources of data and evidence can be fundamentally different (Denyer & Tranfield, 2009). Therefore, organisational interventions are often dissimilar and complex. Realist evaluation was developed to assist researchers synthesising complex interventions (Pawson & Tilley, 1997). With foundations in programme theory (identifying the underlying theory about why an intervention is effective), realist evaluation emphasises the importance of context when synthesising interventions. Evaluators are advised to focus on “what works for whom, in what circumstances, in what respects and over which duration” (p. 15) rather than surmising whether the type of intervention is effective or not (Pawson, 2013). Realist evaluation has the premise that underlying theory provides the answers to why and how interventions work in some circumstances, but not in others (Astbury & Leeuw, 2010).

Denyer and colleagues (2008) revised medically based systematic review frameworks, such as PICO, to create a framework relevant to the complexity of organisational interventions entitled the CIMO-logic. Here the context (C) is defined as the environment or human factors, the intervention (I) as specified in the research question, the mechanisms (M) created by the intervention as the key components for its efficacy, and the outcomes (O) ranging from performance to cost reduction (Denyer et al., 2008). The CIMO-logic can be applied to interventions to understand how and why some may be more effective than others by examining the interactions between the context, intervention, mechanisms and outcomes (for an example see Doyle & McDowall, 2019). Due to the potential complexity of interventions involving adults with ADHD, it is necessary to adopt a framework that can encompass this complexity and comprise context, therefore, deeming the realist evaluation the most appropriate to address the review aims.

Review Aims

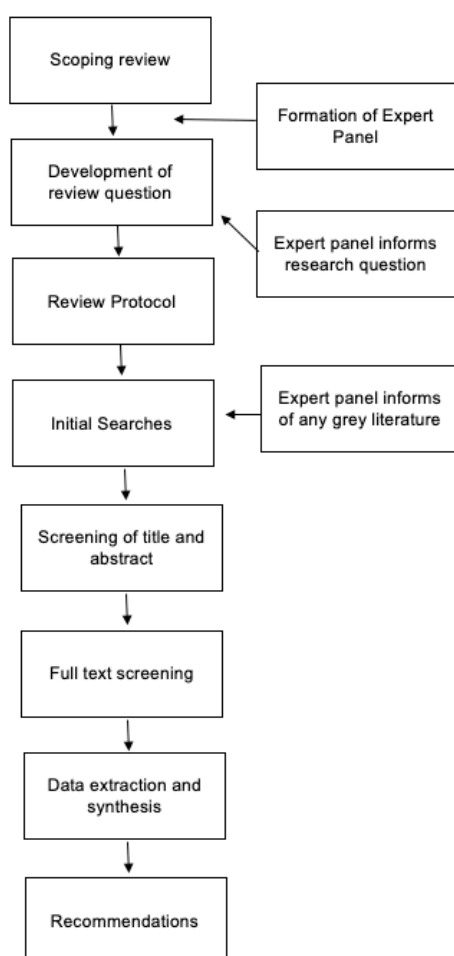
In summary, the aim of the current systematic review was to synthesise, using realist synthesis and evaluation, a) the respective types of support/ interventions available to adults with ADHD and b) the evidence for their effectiveness in workplace contexts or on any work-related outcomes.

Method

The review method is displayed in Figure 4.1 which includes the steps where there is involvement from an expert panel. The expert panel differ from the review team because the expert panel offers general advice from a practical perspective at the key points in the process identified below whereas the review team assist in synthesising the studies at all stages of the process.

Figure 4.1

Systematic review method



Scoping Review

In line with best practice guidance a scoping review was undertaken to determine whether a review with a similar (or otherwise informative) review already exists and, if not, to further inform the research question, search terms and any inclusion or exclusion criteria (Centre for Reviews and Dissemination, 2009; Denyer & Tranfield, 2009).

The following databases were searched: EBSCO, Web of Science, Cochrane Library and ABI/INFORM Global and the NICE website checked for relevant reviews. The search terms included: “*adult ADHD*”, “*intervention OR management OR treatment*” and “*systematic OR/AND review OR meta-analysis**”

All abstracts were reviewed, and excluded articles included those examining only child or adolescent samples, studies that were not a systematic review or meta-analysis, as well as those that did not review an intervention. Table 4.1 outlines the 14 existing systematic reviews and meta-analyses identified as part of the scoping review.

Table 4.1*Scoping review findings*

Authors	Design	Population	Interventions compared	Findings	Outcomes
Arnold et al., 2015	Systematic review of 403 studies	Children from age 10 onwards, including adults	Pharmaceutical, non-pharmaceutical and combined	Best outcomes were reported from combination treatments, no studies treated occupational outcomes with non-pharmaceutical or combined treatment	academic, antisocial behaviour, driving, non-medicinal drug use/addictive behaviour, obesity, occupation, services use, self-esteem, and social function
Bruce, Unsworth & Tay, 2014	Systematic review of 13 studies	Adolescents and adults	Non-pharmaceutical	Not enough evidence to make solid conclusions, situation awareness training showed the most promise on improving driving skills	Driving performance
Buoli, Serati & Cahn, 2015	Systematic review of 48 studies	Adults only	Pharmaceutical interventions including: amphetamines, metadoxine, memantine, Nicotinic agonists, modafinil, droxidopa, antidepressants, guanifacine, lithium, aripiprazole, buspirone, galatamine, dasotraline, selegine	Poor data for long term treatment, stimulants containing amphetamine have a more robust efficacy but are associated with serious side effects, antidepressants have evidence to show efficacy but for people with co-occurring bipolar disorder	ADHD symptoms and tolerability

Coghill, 2010	Systematic review of 25 studies	Children and adults (5 studies with adults only)	Pharmaceutical	Medication had a short-term effect on quality of life	Quality of life
DeCrescenzo et al., 2017	Meta review of 40 studies	Children and adults	Pharmacological and non-pharmacological	Pharmacological more effective than placebo but empirical support needed for non-pharmacological treatments	ADHD symptoms
Den Heijer et al., 2017	Systematic review of 25 studies	Children and adults	Exercise	Exercise has some effect on improving executive function, attention and behaviour, it should be a combined treatment	Executive function, attention and behaviour
Gobbo & Louza, 2014	Systematic review of 15 studies	Adolescents and adults	Pharmaceutical	All stimulants improve driving performance in some way, but drug compliance varies	Driving performance
Harpin et al., 2016	Systematic review of 127 studies	Children and adults	Pharmacological, nonpharmacological and multimodal	Self-esteem (89%) and social function (73%) improved when ADHD was treated	Self-esteem and social function

Knouse, Teller & Brooks, 2017	Meta-analyses of 32 studies	Adults only	Cognitive Behavioural Therapy	Cognitive Behavioural Therapy had medium to large effect sizes, longer treatments did not have an effect on better outcomes	ADHD symptoms
Moriyama et al., 2013	Systematic review of 8 meta-analyses	Adults and children	Psychopharmacological and psychotherapy	Stimulants effective short term, psychosocial interventions inconclusive	ADHD Symptoms
Purdie, Hattie & Carroll, 2002	Meta-analysis of 74 studies	Adults and children (2 studies with adults only)	Pharmacological, multi-modal, non-school based, school based and parent training	Larger effect for behavioural rather than educational outcomes, effects larger for medical interventions (.58), stronger effects for educational outcomes and educational interventions	Behaviour and educational outcomes
Shaw et al., 2012	Systematic review of 351 studies	Children from age 10 onwards including adults	Pharmacological, non-pharmacological or multi-modal	Without any treatment the long-term outcomes for ADHD were poorer	academic, antisocial behaviour, driving, non-medicinal drug use/addictive behaviour, obesity, occupation, services use, self-esteem, and social function

Vidal-Estrada et al., 2012	Systematic review of 18 studies	Adults only	Psychological: Cognitive behavioural therapy, meta-cognitive therapy, dialectical behaviour therapy, coaching and cognitive remediation	Cognitive behavioural therapy is most effective on reducing anxiety and depression	Anxiety and depression
Young, Moghaddam & Tickle, 2016	Systematic review of 9 random control trials	Adults only	Cognitive Behavioural Therapy and control group (either waiting list or alternate treatment)	Cognitive Behavioural Therapy had superior effects over the control groups when measuring symptom reduction	ADHD symptoms

The majority of reviews synthesised pharmacological interventions, three reviews were solely drug based and six investigated the efficacy of both pharmacological and non-pharmacological interventions. The non-pharmacological interventions varied in their intervention type and outcomes. One review comprised a range of cognitive-based interventions including meta-cognitive therapy, dialectical behaviour therapy, coaching and cognitive remediation (Vidal-Estrada et al., 2012). The findings suggest that cognitive behavioural therapies are effective in reducing the co-occurring symptoms of anxiety and depression. Two contrasting reviews addressed driving performance (Bruce et al., 2014; Gobbo & Louzã, 2014). One assessed the efficacy of a pharmacological intervention and found stimulants increased driving performance although compliance was mixed (Gobbo & Louzã, 2014). The other review assessed the efficacy of a non-pharmacological intervention finding inconclusive results (Bruce et al., 2014). Other reviews investigated the effectiveness of an intervention that targeted parenting strategies on behaviour and exercise on cognition. Overall, the findings for non-pharmacological interventions were often inconclusive or showed moderate efficacy regarding any effects on a range of symptoms from driving performance to symptom reduction (Bruce et al., 2014; De Crescenzo et al., 2017). The pharmacological interventions administering atomoxetine, indicated high levels of symptom reduction for treatment groups although there was little if any evidence on sustained domain specific behavioural outcomes

The scoping review has highlighted the broad range of outcomes addressed in interventions aimed at adults with ADHD. The outcomes can be categorised as follows:

- self-regulation and emotion: self-esteem, anxiety, and depression,
- social: social function and quality of life,
- cognition: attention, executive function, driving performance, and task performance,
- behaviour and,
- treatment/medical adherence.

Although the outcomes are varied, they draw attention to the wide range of symptoms and experiences of adults with ADHD and demonstrate the complexity and co-occurrence of the disorder. Although occupational outcomes were highlighted to be poorer for adults with ADHD, no interventions appeared to address these outcomes directly (Shaw et al., 2012).

All but one review can be assumed, as not explicitly stated, to have adopted a positivist epistemology, focusing on the effectiveness of the intervention on the outcomes using meta-analysis as a method of examining effectiveness (Moriyama et

al., 2014; De Crescenzo et al., 2017). The omission of epistemological position in reviews is a common criticism of the systematic review literature (Rojon et al., in press.). One review did however claim to adopt a social constructivist approach to explore the efficacy of interventions in educational settings (Purdie et al., 2002). The authors highlight the importance of context in their findings and suggest that interventions designed for educational contexts to improve behavioural and educational outcomes were more effective than medical interventions in the same context. Therefore, the literature is yet to be examined through a critical realist perspective where a realist evaluation framework can support interpretation and analysis.

In summary, the scoping review identifies the need for a holistic approach for reviewing the literature. It is necessary to take a multi-disciplinary perspective to include clinical, medical, psychosocial, educational, and occupational research. Contexts, which can be captured by through a multi-disciplinary approach, are arguably imperative to effectiveness and could be the reason for inconclusive findings in prior reviews. Thus far, the primary aim is to take a realist evaluation approach to focus on the intervention type, method, and outcomes rather than solely the effectiveness of the interventions. In addition, prior reviews have neglected to include occupational contexts, interventions, and outcomes highlighting a gap in the literature. In contrast to the reviews abovementioned, the present review searched a wider range of databases, included outcomes other than a reduction in the core symptoms and included any relevant qualitative research.

Expert Panel

In line with best practice guidelines and prior research (Beauséjour et al., 2013; Gough et al., 2012), the current review incorporated an expert panel ($N = 4$) consultation at multiple points in the review process. The panel included practitioners working in employment support for those with ADHD, an academic whose research focuses on support for adults with ADHD, and a psychoanalyst who works therapeutically with adults with ADHD. Two members of the expert panel disclosed that they have received a diagnosis of ADHD and hence had the dual role of potential 'service users' as recommended in reviews where the public may be impacted by the findings (Oliver et al., 2015).

Research Question Formulation

The experts were invited to answer a set of nine questions relating to ADHD and the protocol review questions. Their responses were analysed using content analysis to identify common themes as summarised in Table 4.2 (Krippendorff, 2004). A key theme identified was the way in which adult ADHD is conceptualised and

defined, adult ADHD was described by the panel to encompass multiple domains and contexts which affect the life span. Emphasis was based on difficulties beyond the core symptoms such as working memory, self-regulation, and the high prevalence of co-occurrences. Strengths were also highlighted in some panel members' answers including enthusiasm, passion, and loyalty. When asked to name the most effective intervention psychoeducation and coaching were the most common response, but it was emphasised that these required delivery from a trained specialist working with adults with ADHD. Research gaps identified by the experts were extremely broad highlighting the necessity for more research across a range of disciplines. Common research gaps mentioned were in alternate interventions such as diet and exercise, managing specific behaviours and relationships, and the impact of diagnosis and stigma on the individual. Finally, workplace related research was identified as a priority for academia in the next five years.

Table 4.2*Findings from the expert panel at the research question stage*

Definition of adult ADHD	Effective interventions	Efficacy of psychological interventions	Research gaps
<ul style="list-style-type: none"> • Lifelong • Working memory • Concentration • Strengths- enthusiasm, passion, loyalty, novelty. • Invisible disability • Self-regulation • Affects multiple domains/ cross-contextual • Co-morbid 	<ul style="list-style-type: none"> • Coaching- the coach must be experienced with ADHD • Technology • Exercise • Medication, initially rather than long-term and • Psychoeducation • Interventions involving the support network around the person • Separate treatment for co-morbidities 	<ul style="list-style-type: none"> • Coaching is effective in boosting work-related performance • Group sessions 	<ul style="list-style-type: none"> • Diet and exercise • Managing hoarding and compulsive behaviours • Improving awareness among public-body decision-makers and GPs • ADHD presentation in females • ADHD in relationships • Workplace support • Stigma and marginalisation

- Targeted at organisational challenges- developing strategies in a job that matches interests

- Success narratives
 - Impact of diagnosis on career success guidelines
-

Review Questions

The review question was presented to each member of the expert panel along with a short rationale. Panel members were invited to propose any changes or confirm that the question was relevant and suitable. Most members did not want to make changes to the question. Suggestions to limit the research to UK based interventions were discussed because it was viewed that these would ensure applicability to a UK context. However, excluding literature from outside the UK increases the risk of bias, especially to context, so it was decided to include studies from all countries.

Based on the CIMO framework, the overarching review questions were: *Which interventions, documented in the literature, aim to support adults with ADHD?*

- a) *In which contexts have any studies been conducted,*
- b) *how can we classify types of intervention,*
- c) *what are the mechanisms in the interventions, and*
- d) *what are the outcomes addressed?*

Review Protocol

The review protocol outlined the review question, expert panel involvement, search terms, selection strategy, quality assessment, and data extraction. The protocol was informed by guidelines and best practice on systematic reviews and is registered with PROSPERO, an international register of prospective systematic reviews (registration number CRD42018092237). Development of a protocol is argued to reduce researcher bias because it ensures clarity in the methods including the selection criteria and sources searched (Kitchenham, 2004).

Selection Strategy

Search Terms. The search terms were formed by dividing the research question into its individual elements. The review team then discussed the variations of the elements. Table 4.3 outlines the final search terms and their variations.

Table 4.3*Search terms*

Element	Variations
Adult ADHD	“Adult ADHD” “Adult ADD” “Adult Attention Deficit Hyperactivity Disorder” “Adult Attention Deficit Disorder”
Interventions	“Intervention” “treatment” “management” “program*” “counsel*” “coaching” “therapy” “trial” “training”

Sources. A wide range of databases from a variety of disciplines were searched, including organisational and management journals. Table 4.4 lists these databases.

Table 4.4*Databases and Journals searched*

Medical, Science, Psychology and Business Databases	ADHD Specific Journals
Academic Search Complete	ADHD Attention Deficit and Hyperactivity Disorders
Business Source Premier	Journal of Attention Disorders
Criminal Justice Abstracts with Full Text	
Library, Information Science & Technology Abstracts	
PsycARTICLES	
PsycINFO	
MEDLINE	
Science Direct	
ProQuest Business Collection	
Scopus	
Web of Science	

The advanced restrictions placed on the search results removed any advice books, magazines etc. that were most likely be excluded at the next stage. The rationale and inclusion criteria are outlined next.

Eligibility

Prior to considering study eligibility, conceptual definitions of key words from the research question were made explicit.

Definitions. To ensure a transparent approach the definitions of what was considered an intervention and outcome were defined as follows.

Intervention. In social sciences, the definition of an intervention's aim is to achieve a change in behaviour (Argyris, 1970) which can be directed towards individuals, groups, families, or peers (APA, n.d.). In medical sciences however, the definition of an intervention is to cure or treat a disease or condition (VA, 2012). Medical interventions are mostly distinguishable as trials or treatments and are classified by their mechanisms of administration (e.g. random control or placebo control trials) (Higgins & Green, 2011). Due to the multidisciplinary approach in the present review and the inclusion of psychosocial interventions the following definition of an intervention was adopted: "...activities, techniques, or strategies that target biological, behavioral, cognitive, emotional, interpersonal, social, or environmental factors with the aim of improving health functioning and well-being" (Institute of Medicine of the National Academies, 2015, p. 31).

Furthermore, the interventions included had to be preventative or therapeutic and not be purely diagnostic or prognostic (Santos et al., 2007). Interventions based on altered brain stimulation were excluded for two reasons because 1) they tend to have a diagnostic purpose, and 2) they are not currently recommended for supporting adult ADHD (NICE, 2018; Kooij et al., 2010). Systematic reviews and meta-analyses were excluded because the focus of the present review was on the specific primary interventions and their respective contexts, methods, and outcomes.

Outcome. In the 'Population, Intervention, Comparison and Outcome' (PICO) framework assisting systematic reviewers in constructing their research question, an outcome is referred to as an "expected result" (Santos et al., 2007, p. 510). Any intervention that did not assess the "expected result" was excluded, for example, interventions solely assessing adverse effects of the drug treatments.

Inclusion Criteria

Inclusion criteria was developed to further ensure consistency and clarity of the studies selected. Participants in the studies had to be over the age of 18 years and

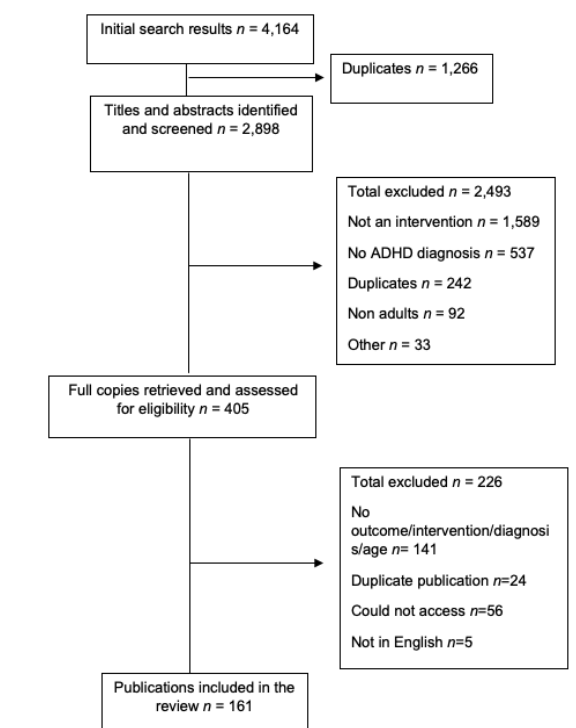
received a formal ADHD diagnosis using the DSM 3, 4 or 5 criteria in the treatment/intervention group prior or at the beginning of the intervention from a clinical practitioner. The intervention itself had to meet the definition previously mentioned, be clearly stated and conducted independently. Studies that involve a combination of pharmacological and psychological treatments were included. The outcomes or findings from the study had to be measurable and defined according to the above-mentioned definition. Qualitative data was included. Finally, no date restriction was placed on the searches, studies could be published or unpublished but had to be written or translated into the English language.

Study Screening for Inclusion. The first step involved screening the study titles and removing any duplicates. At the second step two reviewers from the review team assessed 10% of the abstracts against the inclusion and exclusion criteria and any disagreements were discussed and resolved. I then screened the remaining 90% of the titles and abstracts.

Step three involved reading the full text versions of each study against the criteria and at this step the software review manager, EPPI Reviewer version 4 was used to manage the data and record the decision making. If the full texts were not available, the reviewer emailed the author to request a copy. Figure 4.2 displays the PRISMA figure of the screening process (Moher et al., 2009).

Figure 4.2

Flow chart of the reviews screening process using the PRISMA guidelines



Data Extraction

By adopting the realist evaluative methodology and the exploratory research question, an inductive open-coding approach was applied to the data extraction (Oliver & Sutcliffe, 2012). There were predetermined categories for coding such as recording the actual study design and participant gender ratios. Additional categories were extracted during synthesis including the intention-to-treat analysis and placebo-controlled interventions. The intention-to-treat analysis defined as a type of analysis that includes data from participants who have dropped out in the latter stages (Hollis & Campbell, 1999).

A further framework for extracting information about study quality was developed and shared amongst the review team. For example, studies were rated according to whether they had answered their research question which is subjective (Jarde et al., 2012). Once the final coding framework was established, two reviewers coded 10% of the included studies and then inter-rater reliability was examined. Following a percentage agreement of 93.3%, Cohen's kappa was calculated across the two reviewers and they had a score of $\kappa = .81$ indicating strong agreement (Mchugh, 2012). I then coded the remaining 90% of studies once strong agreement had been identified.

Risk of Bias Assessment

After the full texts were extracted, I assessed them for risk of bias. Assessments for quality help examine the potential risk of bias in the individual studies in order to place weight on the implications of the findings (Higgins & Green, 2011). Quality was assessed against a checklist of 18 questions and a numeric score was calculated. Using a checklist as a form of assessment is more critical but can be subjective (Khan, 2001). The checklist was adapted from three existing quality assessment tools recommended in the Cochrane systematic review guidance: The Newcastle-Ottawa scale (Wells et al., 1999), the Cochrane Collaboration's tool for assessing risk of bias (Higgins & Green, 2011), and the Qualitative Research Checklist from the Critical Appraisal Skills Programme (Tong et al., 2007). Each scale has been developed to assess different methods used in interventions or data collection.

The Newcastle-Ottawa scale was developed to evaluate the quality of non-randomised control trials and observation studies (Margulis et al., 2014). Inter-rater reliability assessments of the measure have been equivocal however, it has been suggested to be more useful and adaptable to apply than other measures (Hartling et al., 2013; Lo et al., 2014; Margulis et al., 2014). The Cochrane Collaboration's tool for assessing risk of bias, adapted from Higgins and Altman, was created to measure, at

length, randomised control trials (Higgins et al., 2011). An evaluation of the scale revealed positive overall experiences of using the tool (Savović et al., 2014). Finally, the Qualitative Research Checklist from the Critical Appraisal skills programme was designed to evaluate the quality of studies using interviews or focus groups to collect data (Tong et al., 2007). It is argued to be a good tool to use in assessments of health policy intervention research (Rychetnik, et al., 2006). Therefore, they were combined and adapted to facilitate for the variation in intervention types and methods of data collection, see Table 4.5 for domains and example items. In addition, I incorporated the CIMO framework into the quality assessment to reflect the purpose and interests of the present review.

Table 4.5

Example items from the risk of bias tool

Domain	Example Items	Total items
Detection	Were participants blind to the outcome assessment?	1
Attrition	Did the data sufficiently support the findings?	2
Reporting	Have ethical issues been considered?	6
Selection	Was the recruitment strategy appropriate to the aims of the research?	4
Performance	Were participants blind to the intervention rationale?	3
Other	What was the length of follow-up in months?	3

Each study included in the review received a score based on the checklist which was then compared to the scores in Table 4.6 as an overall assessment of bias.

Table 4.6*Adapted risk of bias scoring tool*

Score /24	Risk of bias	Interpretation
0-8	Low risk of bias	Bias, if present, is unlikely to alter the results seriously
9-16	Unclear risk of bias	A risk of bias that raises some doubt about the results
17-24	High risk of bias	Bias may alter the results seriously

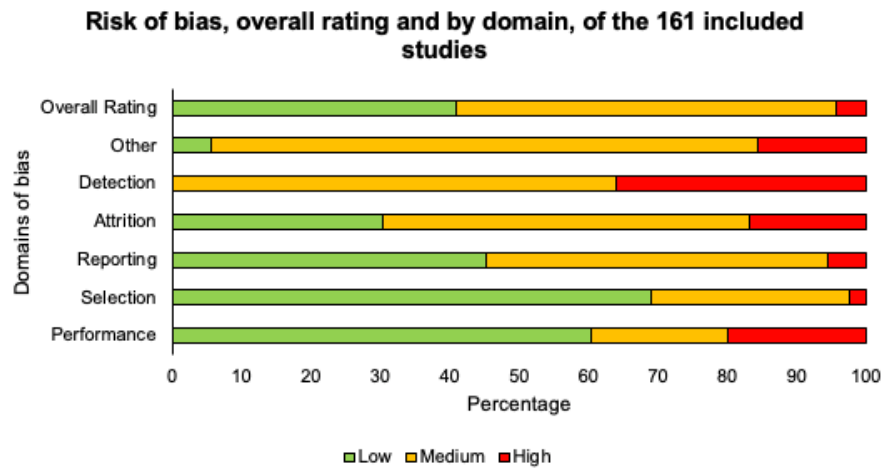
Note. Adapted from “The Cochrane Collaboration’s tool for assessing risk of bias in randomised trials”, by J.P.T. Higgins, D.G. Altman, P.C. Gøtzsche, P. Jüni, D. Moher, A.D. Oxman, J. Savovic, K.F. Schulz, L. Weeks, J.A.C Sterne, Cochrane Bias Methods Group, and Cochrane Statistical Methods Group, 2011, *BMJ* (Clinical Research Ed) (<https://doi.org/10.1136/bmj.d5928>).

I assessed one hundred and forty-five included studies for risk of bias based on the adapted tool (two members of the review team had assessed 16 studies). Each study was given a score for each category of bias: detection, selection, reporting, attrition, performance, and other. These scores were then averaged, and the overall rating was calculated. Figure 4.3 displays the overall rating and ratings by domain for all the studies as a percentage. Most of studies (54%) were rated as unclear risk of bias, which raises some doubt about the results, due to the ambiguity and the lack of detail provided in the studies’ methodology and findings. In relation to psychosocial studies, it was a challenge to comprehend the details of intervention the ‘skills training’ interventions listed the skills they targeted but did not provide examples of how these skills were targeted. The lack of detail may be due to publication restrictions on word count, privacy (training designed for commercial implications), or little theoretical application. Despite the reasoning, the lack of detail means that studies are difficult to replicate so the generalisability of the findings are limited. A total of 4% of the studies were rated as at high risk of bias and these tended to include poorer ratings across the categories. On the other hand, a large percentage of studies were rated at a low risk of bias in domains of performance (60%) and selection (68%) indicating a strength in research around blinding of the control and the intervention group. A further strength identified was the appropriate recruitment strategy to encourage participation from individuals who are generalisable to the ADHD population compared to recruiting

student samples which are often critiqued for their lack of ecological validity (Bello et al., 2014).

Figure 4.3

Risk of bias scores, by percentage, for the 161 included studies



Results

The results are presented in two parts consistent with the review question. Part one provides a systematic map of the studies with their representative characteristics to give an overview of the interventions documented in the literature and the field. The second part contains a realist evaluative synthesis of the interventions discussing the contexts in which they have been studied, the mechanisms in the interventions, and the outcomes addressed.

Systematic Mapping

A total of 161 articles were included and synthesised in the findings. Each study is listed in Table 4.7 with its representative (a) year of publication, (b) intervention type, (c) country, (d) total sample, (e) gender ratio, (f) design, and (g) length of follow-up in weeks. The studies were published from 1989 to 2019 as summarised in presented in Figure 4.4. There are two peaks in publications that reflect prior systematic review findings and represent the contextual shifts in understanding and diagnosis of adult ADHD. In 2008, the National Institute of Clinical Excellence (NICE) guidelines were released which unlike previous versions, included methods to support adults with ADHD. The second and most significant peak in publications is after 2013 where the upgraded criteria for adults with ADHD was published in the Diagnostic Statistical Manual (DSM) version five (2013), which was the first time ADHD symptoms and experiences in adults were duly noted as part of the diagnostic criteria.

Figure 4.4

Publication dates of included studies

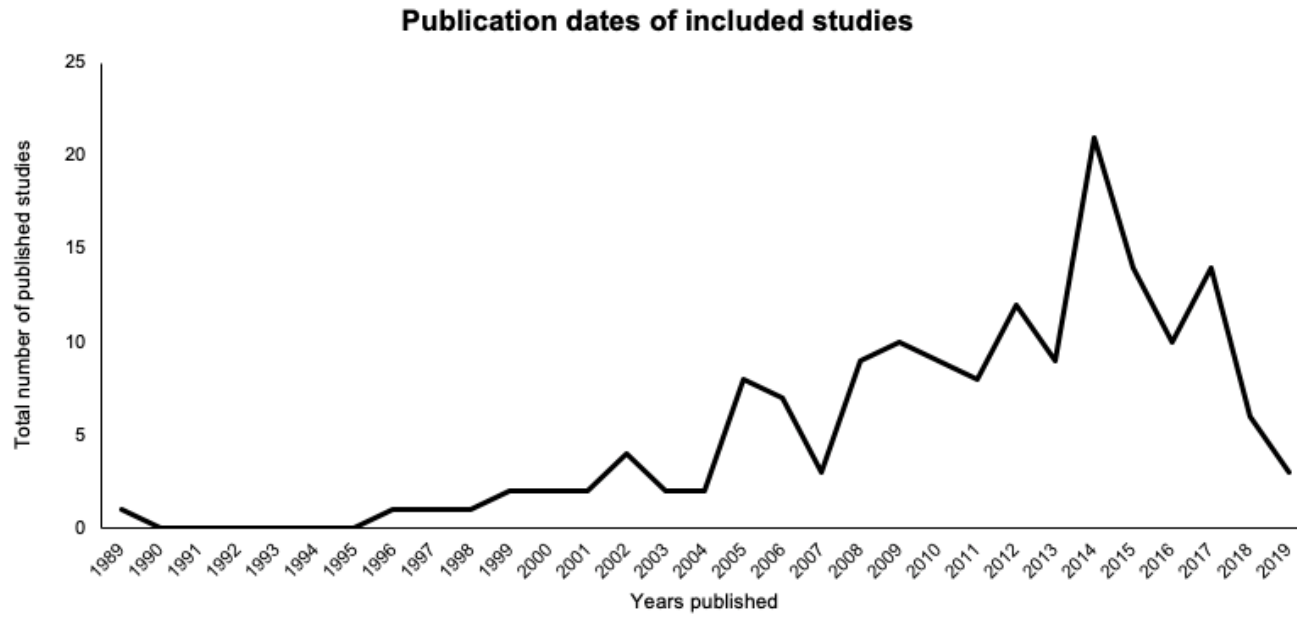


Table 4.7

Characteristics of included studies in final review: by author, year, intervention type, country, sample, gender, design, and follow-up

no	Author	Year	Intervention type	Country	Sample	Gender (% male)	Design	Follow-up (weeks)
1	Adler et al.	2009	Pharma	USA	306	53.6	RCT	16
2	Adler et al.	2008	Pharma	USA	410	56-63	RCT	24
3	Adler et al.	2009	Pharma	USA	501	50	RCT	24
4	Adler et al.	2014	Pharma	USA	29	53-70	CBA	14
5	Adler et al.	2008	Pharma	USA	420	32-67	RCT	4
6	Adler et al.	2010	Pharma	USA	18	83.3	SBA	10
7	Adler et al.	2017	Pharma	USA	40	63	SBA	12
8	Adler et al.	2011	Pharma	USA	540	52	CBA	52
9	Adler et al.	2009	Pharma	USA	226	55-57	RCT	7
10	Agay et al.	2014	Pharma	USA	39	ns	CBA	0.14
11	Amiri et al.	2012	Pharma	Iran	41	62	RCT	6
12	Arnold et al.	2014	Pharma	USA	330	53-70	RCT	9
13	Aron et al.	2003	Pharma	UK	26	77	CBA	0.28
14	Bachmann et al.	2018	Psycho	Germany	74	55	RCT	8

15	Biederman et al.	2019	Pharma	USA	344	48-56	RCT	6
16	Biederman et al.	2006	Pharma	USA	141	47-57	RCT	6
17	Biederman et al.	2017	Pharma	USA	26	42-50	RCT	12
18	Biederman et al.	2010	Pharma	USA	227	40	RCT	34
19	Biederman et al.	2005	Pharma	USA	221	56-66	RCT	104
20	Bihlar Muld et al.	2016	Psycho	Sweden	40	100	SBA	6
21	Bijlenga et al.	2015	Pharma	The Netherlands	145	50-56	SBA	0.14
22	Bloch et al.	2017	Pharma	Israel	61	61	CBA	0.14
23	Boonstra et al.	2005	Pharma	Netherlands	45	49	RCT	3
24	Bron et al.	2014	Pharma	Netherlands	22	88	RCT	6
25	Bueno et al.	2015	Psycho	Brazil	29	50	CBA	8
26	Buitelaar et al.	2012	Pharma	Europe	200	31-54	RCT	52
27	Burt et al.	1997	Psycho	Canada	5	ns	SBA	8
28	Butterfield et al.	2016	Pharma	USA	26	46	RCT	10
29	Carpentier et al.	2005	Pharma	Netherlands	19	88	RCT	8
30	Casas et al.	2013	Pharma	Europe	279	44-52	RCT	13
31	Cherkasova et al.	2016	Psycho	Canada	88	69	RCT	12

32	Congdon et al.	2014	Pharma	USA	97	ns	RCT	0.14
33	Conzelmann et al.	2016	Pharma	Germany	61	52	CBA	0.14
34	Cooper et al.	2017	Pharma	UK	30	50	RCT	6
35	Corbisiero et al.	2019	Comb	Switzerland	43	55.8	RCT	36
36	Cox et al.	2012	Pharma	USA	17	82	RCT	24
37	Dittner et al.	2018	Psycho	UK	60	60-79	RCT	15
38	Dorrego et al.	2002	Pharma	Spain	32	83	RCT	18
39	DuPaul et al.	2012	Pharma	USA	50	54-62	RCT	5
40	Durell et al.	2014	Pharma	USA & Puerto Rico	245	56-58	RCT	12
41	Eddy et al.	2015	Psycho	USA	4	75	SBA	8
42	Edebol et al.	2013	Pharma	Sweden	10	80	SBA	12
43	Edel et al.	2017	Psycho	Germany	91	60	CBA	13
44	Fallu et al.	2006	Pharma	Canada	30	56	SBA	5
45	Fan et al.	2017	Pharma	Taiwan	36	42	RCT	8
46	Fargason et al.	2011	Pharma	USA	36	52	RCT	8
47	Fredriksen et al.	2014	Pharma	Norway	232	48	SBA	52
48	Frick et al.	2017	Pharma	USA	437	51-65	RCT	6

49	Fuermaier et al.	2014	Psycho	Netherlands	1	100	CBA	2
50	Fuermaier et al.	2017	Pharma	Germany	103	49	CBA	0.14
51	Ginsberg & Lindefors	2012	Pharma	Sweden	30	100	RCT	52
52	Ginsberg et al.	2015	Pharma	Sweden	15	100	RCT	156
53	Goodman et al.	2005	Pharma	USA	725	44-55	SBA	10
54	Goodman et al.	2017	Pharma	USA	279	50-54	RCT	6
55	Goto et al.	2017	Pharma	Asia	386	51-53	RCT	10
56	Gropper et al.	2014	Psycho	Canada	45	34	RCT	8
57	Halder & Kumar.	2009	Psycho	India	1	100	SBA	ns
58	Hamedi et al.	2014	Pharma	Iran	42	64	RCT	6
59	Hirata et al.	2014	Pharma	Japan	207	50	RCT	48
60	Hirvikoski et al.	2017	Psycho	Sweden	76	36-47	RCT	8
61	Hornig-Rohan & Amsterdam	2002	Pharma	USA	17	71	SBA	6
62	Horrigan & Barnhill	2000	Pharma	USA	24	50	SBA	52
63	Hoxhaj et al.	2018	Psycho	Germany	81	44-52.5	RCT	8
64	Huang et al.	2017	Psycho	China	108	54-69	RCT	24
65	Huss et al.	2014	Pharma	9 countries	632	51-57	RCT	9

66	In de Braek et al.	2012	Psycho	Netherlands	27	63	RCT	24
67	Janssen et al.	2018	Comb	Netherlands	120	47	RCT	24
68	Bramham et al.	2009	Psycho	UK	78	66	CBA	12
69	Johnson et al.	2010	Pharma	Sweden	20	60	SBA	10
70	Kako et al.	2007	Pharma	Japan	1	0	SBA	22
71	Kinsbourne et al.	2001	Pharma	USA	17	41	RCT	0.56
72	Kittel-Schneider et al.	2016	Pharma	Germany	70	57	CBA	12
73	Koblan et al.	2015	Pharma	USA	255	56-60	RCT	4
74	Kollins et al.	2009	Pharma	USA	33	52	RCT	0.14
75	Kollins et al.	2013	Pharma	USA	33	55	RCT	0.14
76	Konstenius et al.	2010	Pharma	Sweden	24	75-83	RCT	12
77	Konstenius et al.	2014	Pharma	Sweden	54	100	RCT	24
78	Kooij et al.	2004	Pharma	Netherlands	45	53	RCT	7
79	Kubik	2009	Psycho	USA	83	33	CBA	208
80	LaCount et al.	2015	Psycho	USA	12	41	SBA	10
81	LaLonde et al.	2013	Comb	USA	1	100	SBA	104
82	Lee et al.	2014	Pharma	Asia	74	35-41	CBA	10

83	Lensing et al.	2015	Pharma	Norway	149	34-41	CBA	0.14
84	Leuchter et al.	2014	Pharma	USA	40	ns	RCT	1
85	Levin et al.	2015	Comb	USA	126	82-89	RCT	13
86	Levin et al.	2006	Pharma	USA	88	55-66	RCT	12
87	Liebrez et al.	2012	Pharma	Switzerland	1	100	SBA	208
88	Liu et al.	2016	Psycho	Canada	68	38-52	RCT	3
89	Lubow et al.	2014	Pharma	Israel	70	50	CBA	0.14
90	Manor et al.	2012	Pharma	Israel	113	57-65	RCT	6
91	Marchant et al.	2011	Pharma	USA	52	61-81	RRC	8
92	Martin et al.	2018	Pharma	USA	9	55	CBA	0
93	Martin et al.	2014	Pharma	USA	142	61	RCT	2
94	Mattos et al.	2013	Pharma	Brazil	60	66.7	SBA	12
95	McRae-Clark et al.	2011	Pharma	USA	6	42.9	SBA	8
96	Medori et al.	2008	Pharma	Europe	304	45-61	RCT	5
97	Mehta et al.	2000	Pharma	UK	1	100	SBA	0.14
98	Mitchell et al.	2017	Psycho	USA	22	33-45	CBA	8
99	Mitchell et al.	2008	Psycho	USA	2	100	SBA	10

100	Morgensterns et al.	2015	Psycho	Sweden	51	31.6	SBA	12
101	Overtoom et al.	2009	Pharma	Netherlands	12	50	RCT	0.14
102	Paterson et al.	1999	Pharma	Australia & New Zealand	45	53	RCT	6
103	Pettersson et al.	2017	Psycho	Sweden	45	36	RCT	24
104	Philipsen et al.	2016	Comb	Germany	419	43-54	RCT	52
105	Philipsen et al.	2007	Psycho	Germany	66	60	SBA	13
106	Potter et al.	2009	Pharma	USA	15	40	RCT	0.14
107	Puente & Mitchell	2016	Psycho	USA	1	100	SBA	12
108	Ramos-Quiroga et al.	2008	Pharma	Spain	70	68.6	SBA	24
109	Ramsay & Rostain	2011	Psycho	USA	5	80	SBA	24
110	Reimherr et al.	2015	Pharma	USA	128	38-63	CBA	8
111	Reimherr et al.	2005	Pharma	USA	47	86	CBA	6
112	Retz et al.	2012	Pharma	Germany	155	38-56	RCT	8
113	Riahi et al.	2010	Pharma	Iran	40	45	RCT	6
114	Rivkin et al.	2012	Pharma	USA	36	58-66	RCT	4
115	Rosenfield et al.	2008	Comb	USA	1	100	SBA	53
116	Rösler et al.	2009	Pharma	Germany	359	50	RCT	24

117	Rostain & Ramsay	2006	Comb	USA	43	74	SBA	24
118	Rucklidge et al.	2011	Psycho	New Zealand	28	61	CBA	8
119	Salakari et al.	2010	Psycho	Finland	25	48	SBA	11
120	Salomone et al.	2015	Psycho	Ireland	29	71	RCT	5
121	Schoenberg et al.	2014	Psycho	The Netherlands	50	ns	RCT	12
122	Schubiner et al.	2002	Pharma	USA	48	88-92	RCT	13
123	Shekim et al.	1989	Pharma	USA	8	44	SBA	4
124	Snitselaar et al.	2013	Pharma	The Netherlands	10	80	SBA	4
125	Sobanski et al.	2012	Pharma	Germany	43	24-60	RCT	12
126	Sobanski et al.	2013	Pharma	Germany	43	43-60	RCT	3
127	Solanto et al.	2008	Psycho	USA	38	60	SBA	12
128	Spencer et al.	1998	Pharma	USA	42	48	RCT	8
129	Spencer et al.	2007	Pharma	USA	184	69	RCT	5
130	Spencer et al.	2011	Pharma	USA	44	49-50	RCT	6
131	Spencer et al.	2001	Pharma	USA	27	56	RCT	7
132	Spencer et al.	2005	Pharma	USA	146	54-59	RCT	6
133	Stern et al.	2016	Psycho	Israel	60	43	RCT	0.14

134	Stevenson et al.	2003	Psycho	Australia	35	63	RCT	12
135	Stevenson et al.	2002	Psycho	Australia	43	67	RCT	8
136	Surman et al.	2013	Pharma	USA	28	74	SBA	12
137	Surman et al.	2019	Pharma	USA	44	36.5	RCT	12
138	Takahashi et al.	2014	Pharma	Asia	43	68	SBA	8
139	Takahashi et al.	2011	Pharma	Japan	45	42	SBA	8
140	Takahashi et al.	2014	Pharma	Japan	269	69-71	RCT	8
141	Torgersen et al.	2014	Pharma	Norway	117	72	SBA	54
142	Turner et al.	2005	Pharma	UK	18	79	RCT	2
143	Turner et al.	2004	Pharma	UK	20	35	RCT	1
144	Upadhyaya et al.	2013	Pharma	International	349	57-61	RCT	25
145	Van der Oord et al.	2018	Psycho	Belgium	58	68-70	RCT	6
146	van Emmerik et al.	2015	Psycho	The Netherlands	2	100	SBA	8
147	Virta et al.	2015	Psycho	Finland	58	26	CBA	0.14
148	Virta et al.	2010	Psycho	Finland	29	48	RCT	10
149	Weisler et al.	2006	Pharma	USA	248	29-41	RCT	4
150	Weiss & Hechtman	2006	Comb	USA & Canada	98	64	RCT	20

151	Wender et al.	2010	Pharma	USA	57	72	SBA	53
152	White & Shah	2006	Psycho	USA	34	48	RCT	1
153	Wietecha et al.	2016	Pharma	USA	1003	47-50	RCT	26
154	Wietecha et al.	2012	Pharma	USA	502	43-51	RCT	24
155	Wigal et al.	2010	Pharma	USA	142	57-64	RCT	7
156	Wiggins et al.	1999	Psycho	USA	17	89	CBA	4
157	Wilens et al.	2008	Pharma	USA & Canada	80	84-85	RCT	12
158	Wilens et al.	1996	Pharma	USA	41	51	RCT	6
159	Wilens et al.	2005	Pharma	USA	162	60	RCT	8
160	Wilens et al.	2008	Pharma	USA	126	66-74	RCT	8
161	Young et al.	2015	Comb	Iceland	95	31-43	RCT	12

Note. not specified (ns), pharmacological (pharma), psychosocial (psycho), combined (comb), randomised control trail (RCT), simple before and after (SBA), controlled before and after (CBA).

A total of 17,521 participants were involved in the studies. The mean sample per study was 109, but studies had typically high levels of drop-out rates at follow up, ranging from 0% to 87% (Adler et al., 2011; Fan et al., 2017). Follow-up length varied greatly, ranging from the same day to four years (Bloch et al., 2015; Liebreuz et al., 2016). The mean follow-up length was 16.5 weeks. Follow-up length was further classified into long-term and short-term with long term being six months or more (19% of studies) and short term less than six months (all other studies).

From the 161 studies, 69.6% were evaluating the efficacy of pharmacological interventions, 24.8% were classified as psychosocial interventions and the remaining 8% evaluated the efficacy of pharmacological combined with psychosocial interventions. Study designs were categorised, similarly to a prior systematic review (Bower et al., 2001), into randomised control trials (RCT; $k = 99$), controlled before and after (CBA; includes control group; $k = 23$), and simple before and after (SBA; no control group; $k = 39$).

Realist synthesis

I will now discuss the synthesis of the 161 studies firstly in terms of intervention classification, then the context in which they took place, followed by possible effective mechanisms in the interventions, and finally the outcomes addressed.

How Can We Classify Types of Intervention?

I classified interventions according to their main aim and discipline either those developed in medical fields as pharmacological and those developed in the social sciences as psychosocial. If the intervention was a combination of the two then it was classified as a combined intervention. The overarching classifications are then further divided by specific types of interventions for example within psychosocial interventions there are mindfulness and cognitive behavioural therapies. Interventions are also grouped according to whether they were delivered to a group, who they involved, and how they were delivered regarding format.

Types. As mentioned in the systematic map, the interventions were classified broadly into three groups depending on the underpinning theories and disciplines in which they were developed. The understanding that ADHD is a neurological imbalance in the brain is dominant in medical disciplines that argue the imbalance can be targeted by specific drugs and forms the first classification of *pharmacological interventions* (Durstun, 2003). The second classification *psychosocial* interventions is based on theorisations that ADHD can be treated through psychological support (Young & Amarasinghe, 2010), and the final classification was entitled *combination interventions* which included studies where a multidisciplinary approach combining both

pharmacological and psychosocial interventions is deemed most effective. Table 4.8 outlines the classifications and their representative underpinning theory and offers a breakdown of the sub-classifications of the interventions.

Table 4.8

Study classifications, sub-classifications and their representative number of studies and underpinning theory

Main classification	Sub-classification	Number of studies	Underpinning theory (mechanisms)
Pharmacological	Stimulants	65	Chemical imbalance in neural networks
	Non-stimulants	29	
	Anti-depressants	11	
	Mixture	7	
Psychosocial	Cognitive Behavioural Therapy	14	Impact of thought on behaviour and emotions
	Mindfulness	6	Regulating attention
	Skills training/Coaching	12	Psychoeducation
	Alternate therapies	8	
Combination	Stimulant and psychosocial	9	Holistic approach

Most studies evaluated pharmacological interventions, assessing the efficacy of the three common drug treatments used to treat adult ADHD; Methylphenidate (MPH), Atomoxetine (ATX) and Lisdexamfetamine dimesylate (LDX) ($k = 112$). Pharmacological interventions can be further categorised according to their drug type as stimulants or anti-depressants. Caye et al. (2018) explain that psychostimulants such as Methylphenidate and Amphetamines are the first line of treatment for ADHD as they are the most researched. Second line treatments involve Atomoxetine and anti-depressants that are often prescribed if psychostimulants are contraindicated or not tolerated or when co-occurrence is present, especially in cases of ADHD and Bipolar Disorder, any substance abuse or Tourette's Syndrome (Caye et al., 2018).

A wide range of psychosocial interventions provided the basis for a quarter (25%) of the studies which were further classified according to the theories forming the basis of the therapies including cognitive behavioural therapy, mindfulness, training

and/or coaching, and alternative therapies. The psychosocial interventions and their sub-classifications are displayed in Table 4.8. Alternative therapies involved a range of approaches, cognitive approaches included group psychotherapy, cognitive remediation, metacognitive therapy, and psychosocial therapy ($k = 8$). These differed from CBT as they did not follow a common CBT practice or identify as using CBT. There were also three studies that took unconventional approaches using whole body vibration, hypnosis and the use of micronutrients.

The remaining nine studies combined pharmacological and psychosocial interventions. The majority of the nine studies were stimulant treatment combined with cognitive behavioural therapy ($k = 5$). Other psychosocial therapies combined with medication were coaching, group psychotherapy and problem-focused therapy. One study advanced on the traditional two group comparison by comparing individual counselling to group psychotherapy in pharmacologically treated participants aiming to explore the most effective psychosocial treatment.

The Group. Interventions can be further classified by their delivery- whether they are delivered on an individual basis or to a group. Of the 161 studies synthesised, 22 were delivered to a group or involved a combination of group and individual delivery. All 22 studies were classified as psychosocial or a combination of pharmacological and psychosocial. Of the 22 studies, 19 were classified as effective, 15 were conducted in European countries with 12 being conducted in universities, research centres or university hospitals. Group interventions are beneficial in supporting medical conditions due to being with those who are similar and sharing the experience (Jackson et al., 2014). In educational contexts, learning in a group also increases self-efficacy through higher levels of hope and motivation (Tian, 2018). However, only seven studies directly assessed outcomes relating to self-esteem or efficacy with one study additionally measuring social functioning. Therefore, it is difficult to compare the effectiveness of group versus individual interventions because the theorised benefits are not consistently measured.

Involvement of Others. Group interventions tend to include only those who the intervention is aimed at. There is however an argument that involving the individual's support network during the intervention may be more effective, especially around the challenges of interpersonal relationships in their personal life (Goto et al., 2017). Only five interventions involved someone in the delivery of the intervention that was not the clinician or individual with ADHD.

Of the five studies, one included the adult with ADHD's significant other, friend or family member (Hirvikoski et al., 2017). Hirvikoski et al. (2017) note that the second most popular choice of support person was a parent highlighting the importance of

parent relationships for supporting ADHD in adulthood. Their findings were positive with an increase in knowledge, improvements in functioning and high adherence with 90% of participants completing the intervention. There were three case-studies that involved the individuals' wives as part of the intervention, one attended the intervention as it was recommended in the programme guidelines (Solanto, et al., 2008), another attended therapy to discuss ways they could support their husband (Mitchell et al., 2009), and the third was more involved on a therapeutic basis by attending marital therapy (Rosenfield et al., 2008). All case-studies had a positive impact on improving organisation skills and reducing symptoms and both highlight in their conclusions that a multi-disciplinary approach involving others is an important part of the efficacy of the intervention. The final study included a 'support person' or 'coach' for help with organisational tasks, and if the adult with ADHD did not have a support person from their own social network, an undergraduate student was allocated to them to adopt the support person role (Stevenson et al., 2002). There were large effect sizes for all outcomes including symptom reduction, organisational skill improvement, reduction in anger, and increase in self-esteem. In short, involving the support network around the individual with ADHD has marked effects on all outcomes emphasising that an encouraging and supportive environment can increase the impact of an intervention.

In Which Contexts Have the Studies Been Conducted?

Pawson (1990) defines contexts as environmental factors that affect behaviour change (Denyer et al., 2008). These contextual factors can be separated into four layers: the infrastructural system, the institutional setting, interpersonal relationships and the individual themselves (Pawson & Tilley, 1997). With regards to the 161 included studies, the contexts discussed map onto the four areas with referrals being infrastructural system, location as an institutional setting, clinician-patient relationship as part of the interpersonal relationships and lastly, co-occurring at the individual layer.

Referrals and Dropout. The context or infrastructural system that is associated with referrals and dropout rates is the specialist centres or clinics for ADHD. Globally, these centres are limited, which has had an impact on society and the research (Magon et al., 2015). With there being no clear and distinct diagnostic criteria specific for ADHD and the limited public knowledge about ADHD, there are often many cases of misdiagnosis and long waiting lists (Jerome, 2016; Marcer et al., 2008). Reports have further suggested the impact of socioeconomic status and location as a potential barrier to a correct diagnosis and treatment (Young et al., 2011).

From the 161 studies 82 were outpatient referrals which means that the adults had received a diagnosis and were immediately referred by the Psychiatrist for their first set of treatment at a specialist centre (Coetzer et al., 2017). Another method of

recruitment was to advertise the intervention and remunerate participants with a formal diagnosis ($k = 5$). These two methods of recruitment attract and include participants who are already aware that they may have ADHD or have recently been diagnosed.

Pawson (2013) suggests that with medication it is difficult to pinpoint the exact moment in which the intervention began, which is particularly true with outpatient referrals as basic knowledge or understanding of ADHD may exist prior to the referral for treatment. As a result of going through the diagnostic process, some level of psychoeducation, researching and learning about ADHD, might have already happened prior to medical treatment. Therefore, it is unclear whether the intervention began at the point in which the adult with ADHD began to learn about ADHD or at the point medication is initiated. This level of self-awareness and knowledge is difficult to measure and is likely to differ greatly between individuals.

Furthermore, as noted, the dropout rates varied greatly across the studies. Adherence is a central part of assessing the efficacy of an intervention (Horwitz & Horwitz, 1993). In pharmacological studies, this is measured through self-report and during follow up sessions and usually is whether the participant has taken the medication or not. Whereas in psychosocial interventions it is assessed differently for example by attendance. A review of medical adherence in children and adults with ADHD found nonadherence rates that ranged from 13.2% to 64% but concluded that there is minimal research addressing reasons for nonadherence in adults (Adler & Nierenberg, 2015).

Location. The most common settings for pharmacological studies were outpatient clinics or multi-centre clinics in North America ($k = 45$). The majority of participants had been referred to the clinic, received a formal diagnosis and then received a treatment. Assessing the effectiveness of pharmaceutical interventions across multiple clinics not only provides researchers and clinicians with information about the impact of the drug in multiple countries, but also provides an indication of the prevalence of ADHD across cultures (Johnson et al., 2012; Polanczyk et al., 2007). Research centres and university settings ($k = 29$) were less effective than medical settings, possibly due to lower accessibility to participants because they are limited to student samples or those already with a diagnosis.

Aside from the traditional medical and educational settings for research, three studies were conducted in prison settings in Sweden highlighting the high prevalence of adult ADHD in the prison population and the need for focusing on treatments for this distinct population and setting (Ginsberg et al., 2015; Ginsberg & Lindefors, 2012; Konstenius et al., 2014).

The Clinician-patient Relationship. Prior research has drawn attention to the significance of the patient and clinician relationship as well as healthcare outcomes (Kelley, et al., 2014). As a potential mechanism, it is argued that the better the quality of the relationship, the quicker the recovery and the higher the rate of adherence (Thompson & McCabe, 2012). The relationship between the clinician-patient is often layered and dynamic making it difficult to directly assess or compare between studies (Street et al., 2009). Key components of an effective relationship are similar in medical and educational settings with research suggesting the following: good management of emotion, high patient or coachee knowledge of their own condition, client/coachee centred approaches and good communication with shared understanding (Jackson et al., 2014; Kelley et al., 2014; Lai & McDowall, 2014; Street et al., 2009). Good management and communication are both subjective and difficult to measure; for example, trust and understanding differ greatly on their definitions and conceptualisations (Chia, 2005). Many of the 161 included studies relied on clinician ratings of symptoms and rarely included the patient. In addition, nearly all the studies had no means of measuring the impact of the clinician/patient relationship with only one measuring patient experience directly. In context, as many of the studies were in outpatient clinics, the initial appointment for the treatment was most likely the first point of contact after receiving a diagnosis for a large proportion of the adults with ADHD, enhancing the importance of a positive and meaningful interaction. Although no measures or understandings were assessed in these studies. Therefore, the clinician-patient relationship is influential and requires further investigation.

Co-occurrence. As a diagnosis ADHD is rarely present without co-occurrences, clinicians suggest that co-occurrence with depression and anxiety is particularly prevalent due to the experiences of failure, lack of support and challenges with regulating emotion (Jensen et al., 1997). In experimental study designs, co-occurrence is considered a confounding variable because it is difficult to isolate any beneficial effects of an intervention to a specific condition (Fortin et al., 2006). As a consequence, most studies excluded co-occurrences as part of their criteria ($k = 138$), whereas others deliberately addressed ADHD with co-occurrences like substance use disorder ($k = 9$). In contrast, there is an argument as to whether removing or excluding participants with co-occurring conditions lessens the external validity (Fortin et al., 2006). Therefore, it is important to note the lack of generalisability in studies which exclude co-occurring conditions because they provide an unrealistic view of ADHD.

Building on the different contexts, I will now discuss how the mechanisms are related to and play a role in the interventions for ADHD.

What are the Mechanisms in the Interventions?

Mechanisms can be defined as the processes or underpinning methods in which the intervention operates in a specific context to produce a specific outcome whereas these mechanisms can be triggered in some contexts and not in others (Dalkin et al., 2015; Denyer et al., 2008). Mechanisms have been understood here as the fundamental processes in which interventions are expected to be effective relating them to the disciplines in which the interventions were developed and theorised, for example, brain chemistry, cognition, psychoeducation, arguably less explicit mechanisms such as novelty interventions and the placebo effect (Denyer et al., 2008).

Brain Chemistry. A large proportion of the studies were pharmacological in nature. From a realist synthesis and evidence-based medicine perspective, randomised controlled drug interventions are the gold standard because the mechanisms, contexts and outcomes have been explored years before the randomised control trial is carried out (Pawson, 2018). For interventions involving stimulants, the process prior to testing the stimulant in humans is extensive (Lipsky & Sharp, 2001). For example, prior to the creation of the stimulant and use in a clinical trial both experiments understanding neurological networks and pathways and research on hormones such as dopamine, antagonist or agonist compounds need to be examined to generate theory. Therefore, the theories and mechanisms have been well established prior to the intervention.

There are, however, limitations that arise when using clinical trials namely that there are challenges generalising to real-world contexts. For instance, one challenge is with compliance and non-compliance is especially prevalent in adults with ADHD (Magon et al., 2015). During RCTs compliance rates are higher than when the drug is used among the general population because adults with ADHD are more likely to be forgetful and disorganised which can be a challenge when the treatment requires the participant to remember to take the medication at certain times of the day (Semerci, 2013). Pawson (2013) explains that neurological theories identify how and why a drug treatment should work in RCTs whereas the range in contexts and mechanisms needs to be explored further to understand how they work in different contexts.

Pharmacological interventions mechanisms encompass brain chemistry whereas, psychosocial interventions include a range of potential mechanisms. I first discuss cognition which is a vital mechanism in Cognitive Behavioural Therapies, then psychoeducation and finally hidden mechanisms.

The Key to Cognition. Cognitive models of ADHD explain a deficit in the prefrontal cortex which is responsible for executive function (Willcutt et al., 2005). Both

Brown (2005) and Barkley (1997), leading researchers in ADHD, have developed theoretical models that explain ADHD as a difficulty in managing executive function resulting in impulsive and inattentive behaviour. These models have been the foundations behind interventions such as cognitive behavioural therapy (CBT), cognitive remediation and working memory or attention training. CBT was developed to address anxiety and depression by altering thought processes and behaviour to avoid the repetitive negative thinking and corresponding behaviour (Beck, 2011). In a Cochrane review, CBT is argued to treat ADHD by tapping into the negative thinking which has been a result of the negative experiences associated with the core symptoms (Lopez et al., 2018). ADHD is also highly co-occurring with anxiety and depression supporting the use of CBT to target co-occurring symptoms. The techniques used in CBT often include psychoeducation followed by the acquisition of techniques to address the individual challenges the person experiences (Huppert, 2009). Goal setting is an integral part of CBT and is useful in assessing effectiveness (Beck, 2011). Of the 13 studies that assessed the efficacy of CBT, only three were long term but nine did include measures of depression and/or anxiety finding positive effects in all but one study. One critical realist study argued that CBT initially targets the symptoms of ADHD thereby reducing the anxiety and depressive symptoms are reduced over time emphasising the importance of a long term follow up (Mcevoy, 2003).

Mindfulness formed the intervention in six of the studies (Bachmann et al., 2018; Bueno et al., 2015; Edel et al., 2017; Hoxhaj et al., 2018; Mitchell et al., 2017; Schoenberg et al., 2014). Similar to CBT, mindfulness aims to tap into cognition. However, CBT is focused on attention rather than other symptoms and aims to focus attention on the present, inner emotions and acceptance (Pirson, 2014). All studies using mindfulness found a positive effect albeit, only two of these assessed mindfulness practices as an outcome.

Psychoeducation. Psychoeducation aims to enhance a person's understanding of mental health by increasing the individual's knowledge and awareness of their condition and supporting them in sharing their experiences with other adults with ADHD. It also offers the opportunity for those supporting the individual such as family members, to help support the individual with ADHD (Anderson et al., 1980). The idea is that self-awareness and knowledge is key in learning strategies to manage any condition or increase functioning rather than simply reduce the symptoms (Lotfi et al., 2010). In some areas, psychoeducation is argued to adopt a strengths-based approach (Lukens & McFarlane, 2004). Despite the strong evidence base as an intervention for affective disorders, there is limited research applying psychoeducation

to adults with ADHD, with only one study adopting psychoeducation directly (Hirvikoski et al., 2017).

Of the 14 skills training and coaching studies identified, seven used psychoeducation elements albeit six did not mention psychoeducation explicitly. These were all deemed effective however psychoeducation aims to increase self-knowledge and awareness which were not measured as outcomes in five of the studies.

Hidden Mechanisms: The Novel Intervention and the Power of the Placebo. The impact of novel ideas and placebo effects have been discussed in realist syntheses as two non-explicit hidden mechanisms of clinical interventions (Newman, 2009). The novelty of the intervention was first suggested as an impactful mechanism in the effectiveness of mindfulness because mindfulness is a relatively new treatment, so it is argued to be more effective (Pawson, 2013). Novelty is defined as anything that is new to the individual and it is argued that the newness increases positive evaluations of the intervention (Pawson, 2013). In relation to ADHD there are two possible factors relating to novelty and the efficacy of the 161 studies. The first is that adults with ADHD are particularly drawn to novel ideas and are more willing to try new things (Kooij et al., 2010). Therefore, if the outcome measure relies on self-report, there may be an overestimate of the intervention's effectiveness based due to novelty and excitement. The second factor is that, as previously mentioned, the ADHD diagnosis is relatively new and many adults in the studies only recently acquired their diagnosis. Thus, it is argued that the treatment will be overrated because it is the first received or that having a diagnosis as a form of intervention in itself (Horwitz & Horwitz, 1993).

Regarding the placebo effect, 77 of the 161 studies included a placebo-controlled study design. The general size of the placebo effect is relatively unknown, yet it remains persistent (Price et al., 2008). Using a placebo group in the study design has been suggested to be effective in clinical research because of the positive belief formation it creates and it has been used to reduce doses of stimulant in children with ADHD (Sandler et al., 2010). In contrast, 26 studies used a waiting list control group, which is classed as no treatment. A long-term review of outcomes of adults with ADHD found that any kind of treatment was more beneficial in the long term than no treatment. Therefore, there are challenges and potential risks in providing no treatment and this is contrary to the best practice guidance for high quality studies recommending a control group with no treatment to reduce bias (Fredriksen et al., 2013).

What Outcomes Have Been Addressed?

The outcomes assessed in each intervention varied greatly across the 161 studies. Initially, the primary outcomes were classified according to whether they involved a measurement of the core symptoms. Those outcomes beyond the core

symptoms were further classified into what they assessed: behaviour, cognition, physical/functioning, social, and person/emotion. Outcomes are additionally discussed in relation to short-term and long-term and effectiveness.

Reducing Core Symptoms. Core outcome measures were defined as any that have been created to assess the three core symptoms of adult ADHD, namely impulsivity, inattention, and hyperactivity. There are several validated measures for adult ADHD and in the majority of the studies a mixture of these measures was used pre and post intervention. From the 161 studies, 31 used the Adult ADHD Rating Scale (ADHD-RS) as their primary outcome, 29 used Conner's Adult ADHD Rating Scales (CAARS) and 26 used Adult Investigator Rating Scale (AISRS). In total, 116 assessed the core symptoms as the primary outcome measure of the intervention. The studies that did not were assessing cognition or functioning as the primary outcome. The authors of the ADHD-RS and the AISRS are prominent authors in the intervention studies and the CAARS was used to validate both measures. It is important to consider the authors as potential sources of bias because of their involvement in developing the measures. In addition, another source of bias is that the instruments require a trained clinician to rate the individual with ADHD often during a consultation so symptoms were not self-reported and based on the perception of the clinician is involved but not dependent on (Kooij et al., 2013; Wietecha et al., 2016).

Beyond the Core Symptoms. Outcomes that were classified as other than the core symptoms are displayed in Table 4.9 with example scales and with number of studies involving these types of measures. The vast range in outcomes suggests the impact of ADHD to all aspects of life beyond the core symptoms, from social relationships to general self-esteem. Regarding effectiveness, cognition related primary outcomes were associated with mixed or unclear results. Outcomes relating to social and emotion/person were assessed more often in psychosocial interventions with overall positive effects of the intervention. Aside from cognitive assessments of outcomes which typical involve using technology and the CGI scale, which is purely based on the clinicians rating, many outcomes were assessed using self-report rating scales (Arnold et al., 2014; Virta et al., 2015).

Table 4.9*Outcomes by category with examples and total number of studies assessing them*

Outcomes	Example Scales	No of studies assessing outcomes
Behavioural	On Time Management Organization and Planning scale (ON-TOP) Substance/Alcohol use Driving performance	31
Cognitive	Continuous Performance Test (CPT) Permanent Product Measure of Performance (PERMP) Verbal memory (WMS-R)	60
Physical/Functioning	Clinical Global Impression (CGI) Adult ADHD Quality of Life Scale (AAQoL) Global Assessment of Functioning (GAF)	104
Social	Social Adjustment Scale Self-Report (SAS-SR) Family Functioning (FAM-111) Dyadic Adjustment Scale (DAS)	7
Emotion/Person	Expression and Emotion Scale–College Student Version (EESC-C) Hamilton Rating Scales for Anxiety/Depression (HAM-A/HAM-D) Beck's Depression Inventory (BDI) General Self-Efficacy Scale (GSES)	56

Long-term versus Short-term. Studies were classified as short-term if the treatment to follow-up was under six months and long-term if they were six months or more. Thus, 130 studies were short-term and 31 were long-term. Combination treatments were more likely to be long-term than short-term ($k = 7$) indicating a longer follow-up. A total of 80% of pharmacological interventions were short-term with more than half of these (55%) lasting less than twelve weeks suggesting an immediacy to the expected effectiveness. In contrast, in psychosocial studies, therapeutic effect is assumed to be less immediate as they tend to address a wider range of symptoms and co-occurrences (Biederman et al., 2012). Long-term research into the impact of ADHD across the life span indicates that symptoms beyond the core symptoms such as functionality and anxiety become more prominent over time the long-term impact of stimulant treatment remains unclear (Ingram et al., 1999).

Effectiveness. Drug treatment provided in medical contexts using a placebo control group were most likely to be efficacious at reducing symptoms. All interventions that were delivered to the group were effective alongside those who included people in the adults' social network as part of the intervention. Interventions that did not show positive results were 17 in total, 15 of those were pharmacological and the remaining two were assessing the efficacy of working memory training and adapted CBT for college students. Interestingly, outcomes relating to alcohol, smoking and substance use were common in these studies and demonstrated not to be effective at reducing these behaviours, suggesting that pharmacological interventions do not target addictive behaviours. To determine effectiveness more precisely, a meta-analysis was conducted on work-related outcomes as discussed in Chapter Five.

The Workplace

The review aimed to include intervention studies that were specifically related to the workplace, carried out in workplace contexts, or involving workplace outcomes. Unfortunately, no studies were conducted in workplace contexts apart from one study which was carried out in a simulated workplace environment (Wigal et al., 2010). Furthermore, no studies included workplace outcomes as their primary outcome meaning that the review team had to manually search for work-related outcomes, often finding them embedded in scales measuring general life functioning.

Out of the 161 included studies, eight directly assessed work-related outcomes and a total of 29 studies assessed outcomes which included an assessment involving a work-related aspect of a functioning scale.

The eight studies that addressed work-related outcomes as one of the primary outcomes used a variety of methods and forms to assess them. Alder et al (2008), Arnold et al (2014) and Goodman et al (2017) used the Endicott Work Productivity Scale (EWPS) which consists of 25 self-report items rated on a 5-point Likert scale assessing the impact of a medical condition on work productivity (Endicott & Nee, 1997). Cherkasova et al. (2016) applied the Organisation and Activation for Work (OAW) measure, Biederman et al. (2017) used the work-life questionnaire, and Dittner et al. (2018) applied the work and social adjustment scale. Lastly, two studies used categorical measures of work-related outcomes. One uses employment status and subsequent information such as benefits and sick leave (Torgersen et al., 2014) and the other assessing whether the participant had maintained employment after the intervention (LaLonde et al., 2013).

Five of the eight studies investigated pharmacological interventions which found equivocal results. Alder et al. (2008) identified an improvement in work productivity in the intervention group however, this was nonsignificant. Biederman et al. (2019) found

no difference improved work productivity in either the intervention or control groups. Arnold et al. (2014) found one significant reduction in the five doses and suggests further research as the stronger dose of Modafinil showed the strongest improvement. Goodman et al. (2017) found a significant improvement in EWPS and Torgersen et al. (2014) found no improvement in occupational status after a one year follow up of stimulant therapy. The remaining two studies measuring direct work-related outcomes discovered that after receiving CBT, there was a significant improvement in OAW score (Cherkasova et al., 2016) and a case study combining Adderall and Coaching revealed that the participant had remained in employment after one year (LaLonde et al., 2013).

As previously mentioned, 29 studies included measurements of outcomes that involved subscales assessing work-related outputs. These instruments can be grouped into two groups, those that assess general organisation and time management and others that assess general functioning. General organisation and time management scales were present in seven studies and included scales like 'ON-TOP' or 'On Time Management Organization and Planning scale' and an adult adapted version of the Child Organisation Skills Measure (COSM). A total of 12 studies used the same functioning measure entitled the 'Sheehan Disability Scale' that requires participants to rate on a Likert scale how much they feel their disability impacts their work, family/home life and social/leisure activities. Other measures relating to life satisfaction and functioning use a similar form of including work as a domain that could be impacted.

Discussion

The primary review question and aim of the review was to synthesise the interventions, documented in the literature, that aim to support adults with ADHD. By adopting a realist evaluation, the studies were synthesised according to the contexts in which they have been conducted, the type of intervention, the mechanisms within them and the outcomes addressed.

A total of 161 studies documented interventions to support adults with ADHD. These studies were synthesised with a realist evaluation approach. Overall, it was difficult to stipulate the key mechanisms, contexts, and outcomes in which the interventions worked best because of a lack of clarity in the methods, findings, and the complexity of the interventions. There were, however, several key themes and important factors for interventions that emerged as possible areas for further investigation as summarised in Table 4.10.

Table 4.10*Findings from the realist evaluation summarised into important factors*

Important factors in interventions for adults with ADHD		
Context	Societal	Access to diagnosis and support, socioeconomic status, national and international policy and guidelines
	Settings	Applicable to a range including: Medical/educational/prison/ workplace
	Interpersonal	Involving others in the intervention, promoting successful clinician-patient/coach-coachee relationships
	Individual	Address co-occurrence
Intervention	Pharmacological	Blinded experimenter and both control and treatment group
	Psychosocial	Autonomy in topics/skills to address, clear methodology and detail of what the intervention involved
	Group/individual	Benefits of the group on shared experiences and meaningfulness
	Combination	Need more studies involving a combination of pharmacological and psychosocial interventions. Include psychoeducation.
Outcomes	Core symptoms	Measured by the clinician, should include participant response and family/ workplace ratings
	Beyond core symptoms	Measure outcomes from all aspects of life and symptomatology e.g. life functioning, emotion, and anxiety.
	Long-term vs short-term	Long-term effectiveness is imperative
	Future	Strengths-based, emphasis on qualitative methods of evaluation

Note. Bold is for future considerations for research.

In addition, a large proportion of the literature has been conducted in the clinical and medical fields subsequently influencing existing policy and guidelines. A need for more robust and clear research exploring psychosocial interventions combined with pharmacological interventions is evident from the existing synthesis. Furthermore, a call for qualitative and strength-based assessment of outcomes is required to form a holistic understanding of intervention effectiveness. Key outcomes to explore include interpersonal relationships, the clinician-patient relationship and adverse effects of stimulant medication. On a societal level, research is limited to a small participant pool in excluding a vast number of undiagnosed adults with ADHD because of the lack of public knowledge, ease of access to diagnosis and support as well as socioeconomic

status. This impacts the research because participants that are aware of their diagnosis may be more self-aware and have better access to specialist support services compared to those with ADHD who are not aware of their condition. Therefore, the current diagnostic and support services disadvantage individuals living in areas where there is a lack of support, general understanding and those who are less able to self-regulate. Existing policy should take socioeconomic status and access to support into account when recommending interventions.

More specifically, psychosocial interventions, especially training and coaching need to explicitly outline their methods and mechanisms. Psychoeducation is a potential mechanism in interventions that greatly influences the efficacy and ultimately the self-awareness and understanding. Student/patient/coachee led interventions also seem to increase the effectiveness by encouraging autonomy of the challenges to address and outcomes relating to self-esteem and self-efficacy. Furthermore, interventions involving a significant other seem to be effective in supporting the person as a whole and increasing the knowledge of those in the individual's social network.

Pawson (2013) argues that interventions are a result of the societal thinking of the time, for example the medical model has led to the increase in interventions relating to pharmaceutical solutions. However, with the potential shift in societal thinking to a more positive and social model of disability, it will be fundamental to examine the effectiveness of new interventions that have theoretical backing in the social model.

Finally, no interventions were conducted in workplace contexts, designed specifically for workplaces, based on theory relevant to the workplace, and limited research measured outcomes specific to employment. Future research must address the vast gap in literature surrounding effective reasonable adjustments and workplace support for adults with ADHD instead of simply documenting poor workplace outcomes.

Limitations

Adopting the systematic review methodology meant that studies found in the grey literature did not meet the inclusion criteria and had to be excluded, despite their interesting premise. In addition, notwithstanding the attempts to include studies that used qualitative methods, no studies met the inclusion criteria limiting the synthesis to quantitative findings.

Conclusions

This chapter concludes that there is a marked gap in the literature on work-related interventions addressing adult ADHD. The findings do however identify effective mechanisms that could be applied to the workplace context such as group-

based interventions and those which involve elements of psychoeducation, where the social support network around the ADHDer are included in the intervention.

Psychoeducation is in line with the social model of disability where the environment should be the target of change, not the individual. Interventions that were categorised as psychosocial were applicable to the workplace because they are likely to improve symptoms related to emotional regulation and social interactions. The next chapter examines this element further by comparing the effectiveness of psychosocial and pharmacological interventions on work-related outcomes.

Chapter 5 A meta-analysis of interventions aiming to support adults with ADHD on work-related outcomes

This chapter draws together the evidence from the systematic review to provide an estimate of how effective both pharmacological and psychosocial interventions are on work-related outcomes. The chapter builds on the evidence-base synthesised in previous chapters, contributing to the second aim of the thesis. It achieves this by aggregating and providing a statistical weighting of the evidence for whether psychosocial interventions are more effective than pharmacological interventions for work-related outcomes. Transferability of skills to the workplace from the psychosocial interventions were argued to be a potential mechanism in the effectiveness, which would then need to be considered for future adjustments.

Pharmacological and Psychosocial Interventions for ADHD

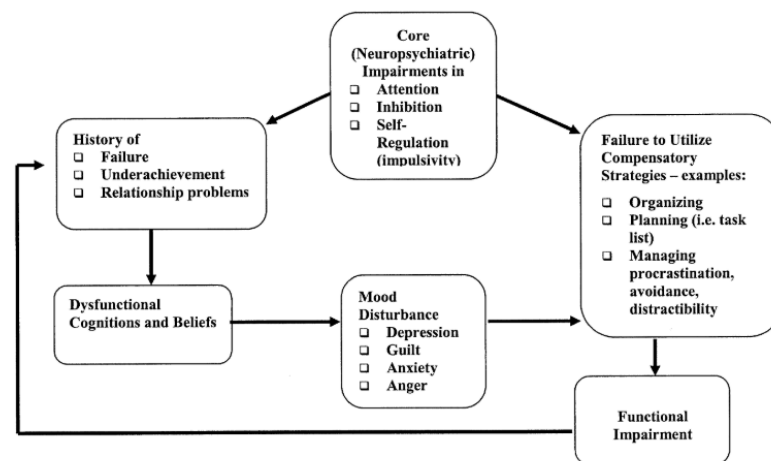
Findings from the systematic review indicated that there was a difference in the mechanisms and effectiveness of pharmacological and psychosocial interventions. Research suggests that pharmacological, drug-based interventions are effective in the short-term for adults with ADHD because of they are formed from the conceptualisation of ADHD as a medical condition (Mészáros et al., 2009). Understanding ADHD as a condition that can be explained by abnormal neurological differences that then impact behaviour, pharmacological interventions aim to treat this difference by altering brain responses through medication (Linderkamp & Lauth, 2011). In contrast, psychosocial interventions are based on the understanding that there are social and cognitive influences on behaviour which result in difference and certain skills can be learned to consequently change behaviour (Linderkamp & Lauth, 2011). Therefore, it is argued whilst pharmacological interventions aim to reduce the core symptoms, by taking a social cognitive approach, psychosocial interventions can target symptoms beyond the core symptoms of ADHD and improve aspects like functioning (Ramsay & Rostain, 2016).

Functioning is defined in the clinical literature to include “body functions, activities and involvement in life situations” (Üstün & Kennedy, 2009, p. 83). For adults with ADHD, functional impairments can be a range of challenges from job changes to divorce rates although it is mostly measured as a clinician’s rating of general coping (Biederman et al., 2006). A recent Cochrane review of CBT for ADHD in adults compared CBT alone to CBT with pharmacological interventions on a range of outcomes including functioning (Lopez et al., 2018). When both types of intervention were combined there was a larger reduction in symptoms and an increase in general functioning.

In an attempt to understand why CBT is effective in improving functioning, Knouse and Safren (2011) conducted a review of CBT for adult ADHD with the purpose of identifying the key active ingredients in CBT. CBT was developed to reduce symptoms of anxiety and depression with the primary aim being to reduce these symptoms (Beck, 2011). CBT strategies involve identifying negative thinking and patterns of behaviour and then work on developing coping skills to challenge these thoughts and ultimately alter behaviour (Ramsay & Rostain, 2011). The findings suggested that targeted learning and practice of specific behavioural compensatory strategies may be the mechanism that is reducing symptoms and improving functioning. The model they refer to from Safren et al. (2004) outlines the cognitive and behavioural challenges experienced by adults with ADHD and how they are influenced by each other (see Figure 5.1). Strategies identified in the model which are described as being not utilised in adult ADHD include organizing, planning, managing procrastination and avoiding distractibility. These strategies need to be practiced in other contexts though interventions assessing the applicability across contexts is less evidenced.

Figure 5.1

A cognitive-behavioural model of challenges experienced by adults with ADHD



Note. From “Psychosocial treatments for adults with attention-deficit/hyperactivity disorder,” by S.A. Safren, S. Sprich, S. Chulvick, and M.W. Otto, 2004, *Psychiatric Clinics of North America*, 27(2), p. 351 ([https://doi.org/10.1016/S0193-953X\(03\)00089-3](https://doi.org/10.1016/S0193-953X(03)00089-3)).

Therefore, despite the evidence supporting the long-term benefits of CBT, the application of what is learned from CBT to other contexts is less discussed (Huang et al., 2015). Moreover, psychosocial interventions identified in the systematic review in Chapter Four included a range of interventions that were not CBT. These included dialectal behavioural therapy (DBT) ($k = 2$), social learning ($k = 3$), goal management training ($k = 2$), attention switching or memory training ($k = 3$), and general skills

training ($k = 2$). The mechanisms in these trainings are distinctly different. For example, research on memory training argues that memory can be trained through cognitive tasks whereas DBT focuses more on the social and emotional learning with a therapist (Edel et al., 2017).

Compared to CBT, the efficacy of these separate trainings is less researched in the literature including their applicability to other contexts outside the training. Furthermore, it is unclear how the transfer of sustaining attention on a short computer based task impacts attention regulation when in a workplace setting (Ramos-Quiroga et al., 2014). A theory that attempts to explain the applicability of learning across contexts is near/far learning (Barr, 2010).

Near/far transfer of learning argues that the more similar the contexts, the more information learned can be transferred (Kim & Lee, 2001). The transfer of learning to different contexts is integral for the strategies to be applied to the workplace, for example, coping strategies developed in CBT sessions need to be applied to the workplace for the individual to cope in contexts outside of the CBT sessions. Research that has addressed near/far transfer in training for children with ADHD has focussed on working memory training and found no effects of far transfer for working memory tasks (Rapport et al., 2013). A study on the transfer for tasks based on problem solving, planning, inhibition and memory replicates no evidence of transfer effects in adults with ADHD (Tajik-Parvinchi et al., 2014).

Therefore, there may be evidence that psychosocial interventions are efficacious for wider symptomatology and general life functioning however, it is unclear whether these effects transfer to contexts such as the workplace which may require particular behaviours and whether the difference between pharmacological and psychosocial interventions impact work-related outcomes. To gain more insight to the effects of psychosocial and pharmacological interventions on work-related outcomes a method of summarising and quantifying the effects of existing studies is required.

Systematic Reviews and Meta-Analyses

With the overall aim of the research being to examine the efficacy of psychosocial and pharmacological interventions as a whole on work-related outcomes a method of synthesis is required that evaluates interventions across studies rather than in isolation.

Why a Meta-Analysis?

Meta-analyses are beneficial to researchers, policy makers and clinicians, for the same reason as systematic reviews, because they are considered to have minimal bias, considered the strongest evidence and are used to influence policy and practice

(Ellis, 2010; Evans, 2003; Moriyama et al., 2013). In the occupational psychology literature, meta-analyses are argued to be a form of systematic review and are recommended for promoting evidence-based practice (Briner & Rousseau, 2011).

Meta-analyses differ compared to systematic reviews because they can quantify the estimate of the intervention effect with more precision (Bartolucci & Hillegass, 2010; Walker et al., 2008). However, similar to limitations of a systematic review, the methodology of data collection means that there is a risk of publication bias, which is caused by neglecting grey and unpublished literature (Cooper, 2017).

Existing Meta-Analyses Involving ADHD

Meta-reviews summarise key findings from meta-analyses and systematic reviews rather than primary studies (Rosenthal, 1995). To gain an overall scope of the meta-analyses that have already been conducted and to investigate whether they compared pharmacological and psychosocial intervention I searched for relevant meta-reviews. A scoping search also checks for reviews that are similar to ensure that the present meta-analysis has not been conducted before. My initial search of meta-reviews examining interventions for adults with ADHD revealed two existing meta-reviews (De Crescenzo et al., 2017; Moriyama et al., 2013). These were selected for the scoping review on the basis that their primary aim was to compare the two intervention types, so they are likely to include existing meta-analyses that compare the effects of both interventions too. Details of each meta-review are presented in Table 5.1.

Table 5.1*Existing meta-reviews on interventions for adults with ADHD*

Authors	Studies	Outcomes	Findings
De Crescenzo et al., 2017	40 studies included of these: 20 systematic reviews 17 meta-analyses 3 pooled analysis of sponsored trials	Symptom reduction	Pharmacological is effective in the short term when compared to placebo effect size of 0.45. Non-pharmacological not enough evidence for adults, some evidence for CBT with an effect size of -1.0
Moriyama et al., 2014	8 meta-analyses 7 pharmacological (vs placebo or alternative pharmacological intervention) 1 pharmacological compared to psychosocial	Symptom reduction	Pharmacological interventions effective in the short term, not enough evidence for psychotherapy

The meta-reviews had mixed findings with regards to effectiveness, they were similar in their outcome choice to extract the data for the outcomes relating general symptom reduction (inattention, hyperactivity, and impulsivity). Both concluded that they did not have enough evidence to estimate the effectiveness for psychosocial/non-pharmacological interventions. The two meta-reviews were published in clinical journals and written to inform clinical practice. Therefore, limited attention was paid to any potential mechanisms underlying the differences between pharmacological and psychosocial interventions or a theoretical framework to understand differences. From the meta-analyses and systematic reviews included in the meta-reviews, only one meta-analysis based the research question on comparing psychosocial and pharmacological interventions (Linderkamp & Lauth, 2011). Findings indicated that from the 55 studies included, 78% assessed the efficacy of pharmacological interventions ($k = 43$) and only 22% assessed psychosocial interventions ($k = 12$). The weighted effect size was medium for pharmacological interventions ($d = .44$) and large for psychosocial interventions ($d = .84$). Consistent with the systematic review findings in Chapter Four, no studies addressed work-related interventions and examined outcomes related to general symptom reduction of life functioning not specific to the

workplace. Therefore, the present meta-analysis is required to examine these outcomes.

Rationale

The overarching systematic review discussed in the previous chapter highlighted that despite the formal recommendations for supporting adult ADHD being a combination of psychosocial and pharmacological interventions, much of the documented literature is based on studies reporting pharmacological interventions. Psychosocial interventions tended to target behaviours and cognitions that were not related to the three core symptoms of ADHD and rather related to general functioning example quality of life (Lopez-Pinar et al., 2018). Mechanisms underpinning psychosocial interventions such as applicability of learned strategies and skills are argued to be more effective than pharmacological interventions which primarily focus on altering brain chemistry (Linderkamp & Lauth, 2011). There is however some research which argues that psychosocial interventions may not reach far transfer to contexts like the workplace (Tajik-Parvinchi et al., 2013). Given that existing meta-analysis have not compared the efficacy of psychosocial interventions compared to pharmacological interventions in the context of work-related outcomes, this was the focus of the present meta-analysis.

Research Question

How effective are pharmacological and psychosocial interventions for adults with ADHD in improving work-related outcomes?

Method

Sample of Studies

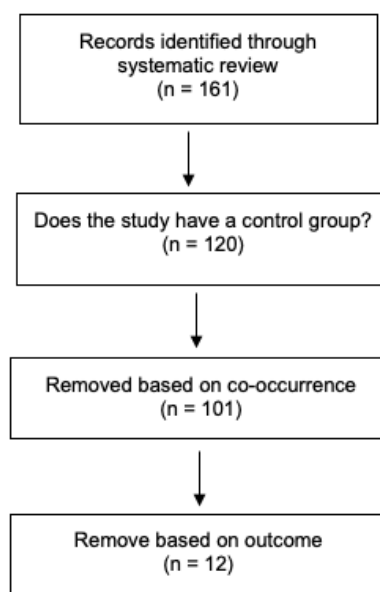
The 161 studies included in the systematic review formed the initial pool of studies in which the selection criteria were applied. All 161 study abstracts and titles were screened. In line with the research question, a total of 12 studies met the eligibility criteria for the meta-analysis.

Selection Criteria

The selection criteria aimed for studies that had a comparable design so thus excluded those studies without a control group (coded as an SBA in the systematic review). Further selection criteria were developed based on the generalisability of participant samples and the conceptualisation of work-related outcomes, see Figure 5.2 for a PRISMA diagram showing the process.

Figure 5.2

PRISMA flowchart illustrating the search process



Sampling

The systematic review highlighted a potential confounding variable in relation to study samples. Studies reporting samples with a known co-occurring diagnosis as their primary diagnosis that was not ADHD were excluded. For example, there were 10 studies where substance use disorder was the primary diagnosis, which highlighted the difference in presentation of ADHD when combined with a co-occurring condition (De Crescenzo et al., 2017; Konstenius et al., 2010).

Outcomes

Finally, studies were excluded if the outcomes assessed were not work-related. Work-related outcomes were defined as items or measures that assess the functioning or performance in work or time management and organisational skills that are related to the workplace. Measures of work functioning are often combined with items that include an aspect of general life functioning and not all studies report the data for the different dimensions. For example, the Sheehan Disability Scale has items measuring work, social, and family/home life so studies were excluded if they reported the overall score on all items however if they reported data specific to the work-related items then these data were extracted and the study included in the analysis. Therefore, this eligibility criteria involved examining the entire study rather than the title and abstract. Details of these measures, including some example items and their representative reliability coefficients are outlined in Table 5.2.

Moderators

Potential methodological moderators identified across the primary studies were the comparability of the control group, the intervention follow-up length, and whether the outcome was assessed using self-report or clinician's ratings. The nature of the control group was considered a possible mediator based on previous findings in a meta-analytic review of psychosocial interventions where the effects were greater if the control group was an alternate intervention compared to no intervention (López-Pinar et al., 2018). Follow up length was defined as whether the outcome measure was collected at less than six months after the first intervention session (short term) or after six months (long term). Again, prior reviews indicate that pharmacological interventions are effective in the short term and psychosocial interventions in the long term (Maneeton, Maneeton, Intaprasert, & Woottitluk, 2014; Young, Moghaddam, & Tickle, 2016). Finally, some research suggests that effects differ by whether outcomes are rated by a clinician or by the participant themselves (Van Voorhees et al., 2011) as both ratings are subjective.

Computation of effect sizes

Studies reported either the mean and standard deviation for both the control and the intervention group at pre-intervention and post-intervention or they reported the mean change and standard deviation in each group computed as the post-intervention mean minus the pre-intervention mean. For studies in which there were different doses of stimulants administered or different interventions, data were extracted at the dose/intervention level and analysed this way. Effect sizes were calculated from the data extracted, hedges g and Cohens d are the most frequently reported effect sizes (Cooper, 2017). Hedge's g is often presented when there are sample sizes below 20 because the computation corrects for small sample sizes whereas Cohens d is known to overestimate the effects (Ellis, 2010). In this case, although some of the sample sizes were considered small, total sample sizes were all above 20 so Cohens d was reported. When interpreting effect sizes, the standard below 0.2 was considered a small effect size, above 0.5 indicated a medium effect size and above 0.8 was interpreted as a large effect size (Cohen, 1988). The d values for each study are presented in Table 5.3. Comprehensive Meta-Analysis Version 3 (CMA) software was used to manage and analyse the data (Borenstein et al., 2009). All effect sizes were computed using the random effects model in the software. The random-effects model is deemed to be more appropriate compared to the fixed effects model in that it does not assume a true effect size and acknowledges the variability in methods commonly observed in psychological studies (Borenstein et al., 2009).

Missing data

Any study that did not provide the necessary information to calculate the effect size were listed and their representative authors contacted to request the details. In total, I contacted authors of four studies, none of whom responded with data. All studies were then excluded.

Table 5.2

Work-related outcomes: details of the measure, purpose, variations, items and responses

Measure	Purpose and variations	Category	Items and responses
Adapted Child Organisational Skills Measure (AOMP)	Developed to measure organisation skills in adults, adapted from the child version (Zentall et al., 1993).	Organisation/task-related	No details provided, child version developed to assess the organisation of time (11 items) and objects (15 items). A 5-point rated response is used but the response labels are not described. Unable to locate any example items or reliability coefficients.
Canadian Occupational Performance Measure (COPM)	Developed to measure occupational performance in a participant-led way (Law et al., 2008).	Work functioning	A self-report measure completed through a semi-structured interview where individuals identify key performance related issues and rates the importance of these using a 10-point scale ranging from 'not important at all' to 'extremely important'. The five most important issues are then rated on two 10-point scales, one rates the satisfaction and the other rates the ability to carry out the problem. No example items. Reliability coefficients range from $r_s = .69-.89$ (Law et al., 2008)

Endicott Work Productivity Scale (EWPS)	Developed to measure the degree to which a health condition impacts the work functioning or productivity of an individual (Endicott & Nee, 1997).	Work functioning	A self-report measure that includes 25 items rated on a 5-point scale of how often the attitude, feeling or behaviour has been present. Scores range from 0 to 100 with 0 being low productivity. A total of four domains are covered in the scale including attendance, quality of work, performance capacity and personal factors. Unable to locate any example items or reliability coefficients
The Quality of life enjoyment and satisfaction questionnaire (Q-LES-Q/ Q-LES-Q-SF)	Developed to assess the overall enjoyment and satisfaction in the different life domains including physical health, subjective feelings, leisure time activities, social relationships, work, household duties, and school/coursework (Endicott et al., 1993). There are two versions, a regular (93 items) and a short version (14 items). A children/adolescent version has also been developed.	Work functioning	A self-report measure consisting of 93 items in total in which 91 are grouped into 8 dimensions and two are based on clinical recommendations. The work aspect includes 13 items rated on a 5-point scales from not at all or never to frequently or all the time. The ratings relate to the previous week and indicate the degree of satisfaction and enjoyment. Example item: <i>“During the past week, how often have you... concentrated on work?”</i> Reliability estimate of internal consistency in adults with ADHD $\alpha = .88$ (Mick et al., 2008).

On Time Management, Organization, and Planning Scale (ON-TOP)	Developed by the authors in the study to assess the perceived competencies related to organizational skills, planning, and time management (Solanto et al., 2008).	Organisation/task-related	<p>A self-report measure where participants are provided with some behaviours and asked to rate their proficiency on each behaviour using a 7-point scale with numerical values ranging from -3 to 3 (far below average to far above average). The total range of possible scores are the totals of each behaviour -102 and 102.</p> <p>Example behaviour: <i>“Completing daily to-do lists”</i></p> <p>Unable to locate reliability coefficients for this measure.</p>
Organisation and Activation for Work (OAW)	Developed to measure organisational functioning by associated authors (Cousins & Galina 2016, as cited in Cherkasova et al., 2016).	Organisation/task-related	<p>A measure involving eight statements about aspects of organizational functioning which are rated on a 4-point scale by both the individual and the clinician.</p> <p>No further details available.</p> <p>Reliability coefficient $\alpha = .85$ (Cherkasova et al., 2016).</p>
Work and Social Adjustment Scale (WSAS)	Developed to measure social adjustment in psychiatric patients, has a scale relating to work (Mundt et al., 2002; Weissman & Bothwell, 1976).	Work functioning	<p>A self-report measure including five items on a 9-point scale which involve rating the level of impairment in work and home life.</p> <p>Example item: <i>“...because of my ADHD my ability to work is impaired. ‘0’ means ‘not at all impaired’ and ‘8’ means very severely impaired to the point I can’t work.”</i></p> <p>Reliability coefficients range from $\alpha = .70 - .94$ (Mundt et al., 2002).</p>

Work Limitation
Questionnaire (WLQ)

Developed from the Sheehan Disability
Scale (SDS) (Coles et al., 2014)

Work functioning

A self-report measure of work productivity loss due to the health condition. The weighted sum of four job demands is calculated into an overall score ranging from 0 to 100.

Reliability coefficients based on the SDS range from $\alpha = .79$ -
91 (Coles et al., 2014).

Results

Study Selection

Based on the above described criteria 12 studies were eligible for analysis. Their details are displayed in Table 5.3.

Study Characteristics

Studies were classified according to their intervention type, whether they were assessing the efficacy of a pharmacological intervention or a psychosocial intervention. Of the 12 included studies, five studies were classified as pharmacological interventions and seven studies classified as psychosocial interventions. The psychosocial interventions mostly involved cognitive behavioural therapy compared to the pharmacological interventions which administered a range of drugs that can be classified as stimulants (methylphenidate), selective norepinephrine reuptake inhibitors (atomoxetine), and eugeroic (modafinil).

Sample sizes ranged from $n = 25$ to $n = 542$ with 2,007 participants included in total ($M = 167$). Using the demographic information provided in the 12 studies, the percentage of males to females ranged from 10-67% and the mean age ranged from 32-42 years. Studies were published from 2002 to 2019 and all included a control group. The control groups varied from placebo control groups in all the pharmacological studies ($k = 5$) compared to control groups that involved an alternative therapy ($k = 4$) or those that involved no treatment such as a waiting list ($k = 3$).

Table 5.3*Included studies and their characteristics*

Author	Year	Intervention type	Specific intervention type	Participant total (n)	Effect size (d)	Control group type	Short/ long term	Outcome measure	Outcome rater
Stevenson et al.	2002	Psycho	Cognitive remediation	25	1.02	ADHD NT	Short	AOSM (O)	Unknown
Adler et al.	2009	Pharma	Atomoxetine	410	0.04	ADHD PBO	Long	EWPS (WF)	Self
Solanto et al.	2010	Psycho	Meta-cognitive therapy	81	0.42	ADHD ALT	Short	ON-TOP (O)	Self
Virta et al.	2010	Psycho	CBT	27	1.54	ADHD NT	Short	Q-LES-Q (WF)	Self
			Cognitive training		0.76				
Sobanski et al.	2012	Pharma	Atomoxetine	43	-0.23	ADHD PBO	Short	Q-LES-Q (WF)	Self
Arnold et al.	2014	Pharma	Modafinil 255mg	542	-0.22	ADHD PBO	Short	EWPS (WF)	Self
			340mg		0.45				
			425mg		0.31				
			510mg		0.36				

Cherkasova et al.	2016	Psycho	CBT	88	-0.54	ADHD ALT	Short	OAW (O)	Clinician and self
Stern et al.	2016	Psycho	Cognitive training	60	0.34	ADHD ALT	Short	COPM (O)	Self
Dittner et al.	2017	Psycho	CBT	45	0.62	ADHD ALT	Long	WSAS (WF)	Self
Goodman et al.	2017	Pharma	Methylphenidate	341	0.36	ADHD PBO	Short	EWPS (WF)	Self
Pettersson et al.	2017	Psycho	Self iCBT	126	0.51	ADHD WL	Long	COPM-P (O)	Self
			Group iCBT		0.78			COMP-P (O)	
			Self iCBT		0.35			COMP-S (O)	
			Group iCBT		0.42			COMP-S (O)	
Biederman et al.	2019	Pharma	Vortioxetine 10mg	219	0.13	ADHD PBO	Short	WLQ (WF)	Self
			20mg		-0.12				

Note. Pharma = Pharmacological; Psycho = Psychosocial; CBT = Cognitive Behavioural Therapy; Self iCBT = individual internet cognitive behavioural therapy; Group iCBT = group internet cognitive behavioural therapy; ADHD NT = ADHD no treatment; ADHD PBO = ADHD Placebo; ADHD ALT = ADHD alternate treatment; Short = short-term; Long = long term; AOSM = Adapted Child Organisational Skills Measure; COMP = Canadian Occupational Performance Measure; EWPS = Endicott Work Productivity Scale; Q-LES-Q = The Quality of life enjoyment and satisfaction questionnaire; ON-TOP = On Time Management, Organization, and Planning Scale; OAW = Organisation and Activation for Work; WSAS = Work and Social Adjustment Scale; WLQ = Work Limitation Questionnaire.

Overall Intervention Effect

The 12 studies had an overall weighted mean effect size of $d = .21$ ($p < .05$) with a 95% confidence interval from .04 to .38. The heterogeneity score was $Q_w(19) = 42.71$, $p = .001$ with an I^2 of 55% showing substantial variance (Higgins et al., 2003). Therefore, a moderator analysis was appropriate to examine any variance beyond sampling error (Lipsey, 2003). A sensitivity analysis was further conducted to examine the effect size if each study was removed (Borenstein et al., 2011). The standardised mean effect sizes ranged from Cohen's $d = .17$ (95% CI [.004, .33], $p < .05$) to Cohen's $d = .25$ (95% CI [.09, .40], $p < .005$) if Cherkasov et al. (2016) was removed.

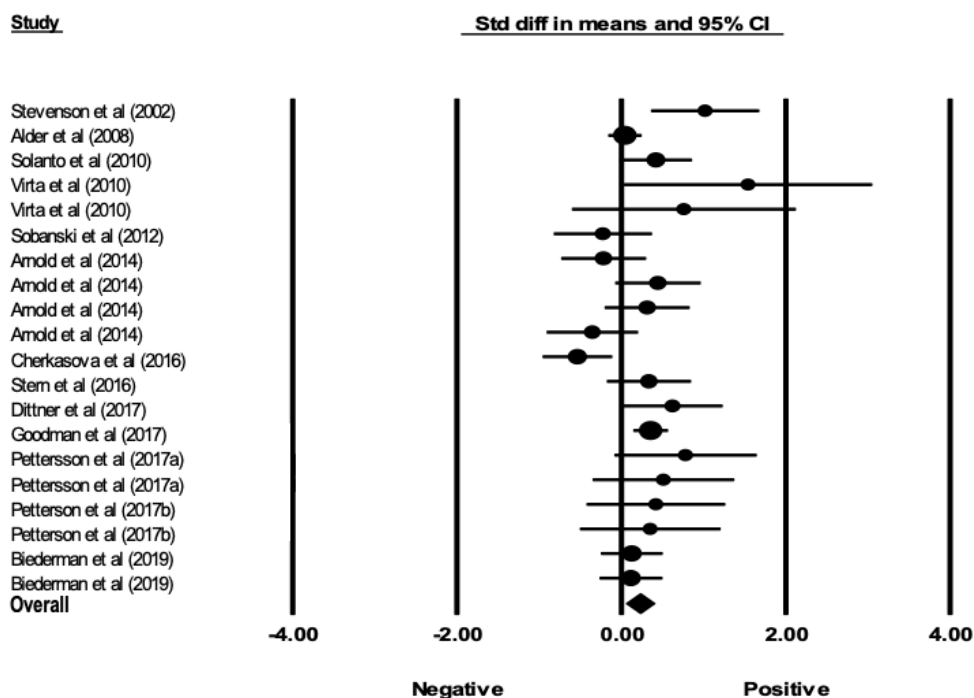
Table 5.4*Summary of effect sizes for each intervention on work-related outcomes*

Study	Dosage/intervention type	Std. difference in means	Lower limit	Upper limit	Z value	<i>p</i> value
Stevenson et al. (2002)	-	1.02	0.36	1.68	3.03	0.00
Adler et al. (2008)	-	0.04	-0.16	0.25	0.41	0.68
Solanto et al. (2010)	-	0.42	-0.02	0.86	1.87	0.06
Virta et al. (2010)	CBT	1.54	0.03	3.05	2.00	0.46
Virta et al. (2010)	Cog training	0.76	-0.60	2.13	1.09	0.28
Sobanski et al. (2010)	-	-0.23	-0.83	0.37	-0.74	0.46
Arnold et al. (2014)	255mg	-0.22	-0.73	0.30	-0.82	0.41
Arnold et al. (2014)	340mg	0.45	-0.08	0.97	1.67	0.10
Arnold et al. (2014)	425mg	0.31	-0.21	0.83	1.19	0.24
Arnold et al. (2014)	510mg	-0.36	-0.91	0.20	-1.25	0.21

Cherkasova et al. (2016)	-	-0.54	-0.96	-0.11	-2.47	0.01
Stern et al. (2016)	-	0.34	-0.18	0.85	1.28	0.20
Dittner et al. (2017)	CBT	0.62	0.01	1.23	2.00	0.05
Goodman et al. (2017)	-	0.36	0.14	0.57	3.27	0.00
Pettersson et al. (2017a)	Group	0.78	-0.09	1.65	1.76	0.08
Pettersson et al. (2017a)	iCBT-S	0.51	-0.35	1.38	1.16	0.25
Pettersson et al. (2017b)	Group	0.42	-0.43	1.27	0.97	
Pettersson et al. (2017b)	iCBT-S	0.35	-0.51	1.21	0.80	0.42
Biederman et al. (2019)	10mg	0.13	-0.25	0.50	0.66	0.51
Biederman et al. (2019)	20mg	0.12	-0.25	0.27	-0.59	0.55

Figure 5.3

Forest plot of included studies



Effects of Pharmacological and Psychosocial Interventions

The weighted mean effect size was calculated for both the pharmacological and psychosocial interventions in a sub-group comparison. For pharmacological interventions there was a non-significant effect size Cohen's $d = .08$ (95% CI [-.09, .25], $p = .35$). In contrast, for psychosocial interventions there was a moderate significant effect size $d = .46$ ($p < .01$) with a 95% confidence interval ranging from .12 to .79. The heterogeneity score was $Q_w(1) = 3.72$, $p = .054$, indicating that the effect sizes were not significantly different from one another. I additionally examined whether there was a significant relationship between each study's sample size and effect size. There was a significant negative correlation between sample size and effect size $r_s(20) = -.62$, $p < .01$ indicating that smaller sample sizes had larger effect sizes, highlighting potential publication bias (Cooper, 2017).

Publication Bias

To assess for publication bias, a visual examination of the funnel plot was carried out followed by the application of the Trim and Fill technique (Duval & Tweedie, 2009). The visual analysis of the funnel plot found asymmetry of the studies towards the mean. An application of the Trim and Fill technique allows for removal of the extreme studies from either the negative or positive side of the mean. In the current meta-analysis, the trim and fill method suggested four theoretical missing studies and

adjusted the effect size from $d = .21$ to $d = .13$ (95% CI [-.05-.31]). Further analysis of Orwin's (1983) Fail-safe N calculated that a total of 58 studies would need to exist for the observed effect to be no longer statistically significant.

Analysis of Moderators

A moderator analysis was conducted to examine potential moderators that could explain the variance in the overall effect size, Table 5.5 outlines the effect sizes and heterogeneity scores for each moderator. Although the rating of the outcome by the self or clinician was identified as a potential moderator, there were not enough studies using clinician-rated outcomes for a comparison. As a result of the difference between psychosocial and pharmacological interventions being non-significant, studies were not grouped this way. Instead each moderator was entered as a subgroup which was then considered the unit of analysis. None of the moderators examined revealed significant differences for length of intervention $Q_w(1) = 0.62$, $p = .43$, type of control group $Q_w(1) = .004$, $p = .95$, or measurement of outcomes $Q_w(1) = 1.06$, $p = .08$.

Table 5.5

Moderator analysis effect sizes and heterogeneity

Moderators	k	d	95% Confidence interval		Heterogeneity Q (between)	
			Low estimate	High estimate		
Length	Short term	14	0.16	-0.06	0.38	0.62
	Long term	6	0.30*	0.03	0.58	
Control group	Alternative therapy	4	0.19	-0.34	0.72	0.004
	No therapy	16	0.21*	0.03	0.39	
Measure	Work	12	0.14	-0.04	0.32	1.06
	Organisation	8	0.37	-0.02	0.76	

* $p < .05$.

Risk of Bias

Despite the attempts to include grey and unpublished literature, discussed in Chapter Four, no studies were identified that could be included in the present meta-analysis. Based on the risk of bias criteria outlined in the systematic review, none of the 12 studies were rated as high risk of bias, four were considered medium risk of bias ($k = 4$) and the remaining were rated low risk of bias ($k = 8$). The studies and their subsequent overall risk of bias rating is presented in Table 5.6.

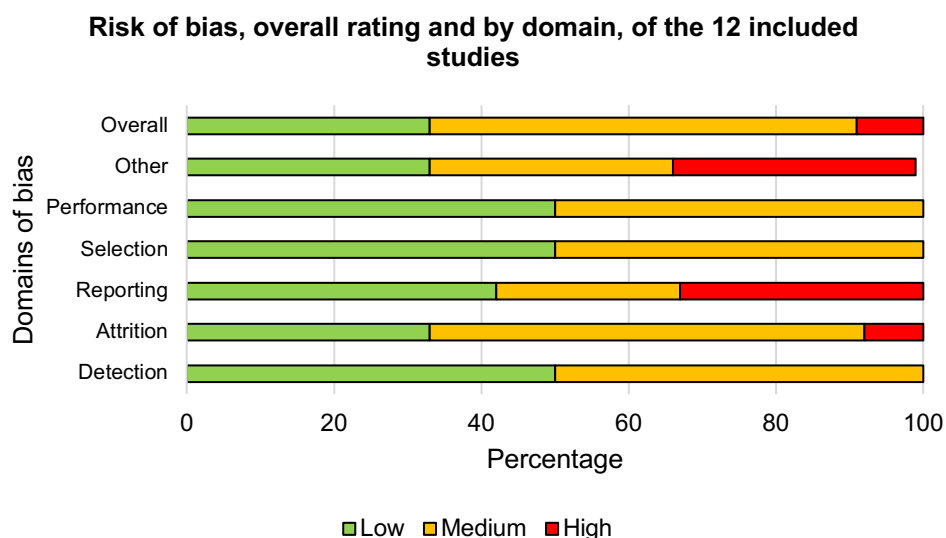
Table 5.6*Risk of bias rating for each included study*

Author	Risk of bias rating
Stevenson et al	Low
Adler et al	Low
Solanto et al	Medium
Virta et al	Low
Sobanski et al	Medium
Arnold et al	Medium
Cherkasova et al	Low
Stern et al	Medium
Dittner et al	Low
Goodman et al	Low
Pettersson et al	Low
Biederman et al	Low

As mentioned above, the present meta-analysis applied the same criteria discussed in the systematic review chapter to rate the risk of bias on each domain. Figure 5.4 is chart illustrating the scores for all included studies on their different quality domains. Studies that were given an unclear or medium risk of bias received the rating for various reasons, some were due to the small sample size (attrition, $k = 1$), some were due to the participants knowing the outcomes being measured (reporting, $k = 4$), and others were for length of follow up being less than a month (other, $k = 2$).

Figure 5.4

Risk of bias assessment



Discussion

Overall the meta-analysis found a small overall effect for interventions improving work-related outcomes. A comparison of the effect sizes between pharmacological and psychosocial interventions found no evidence for a significant difference in effect size for type of intervention.

Due to the heterogeneity highlighted in the overall effect size, moderator effects were examined on other potential study design moderators. Neither length of intervention (short vs long term), type of control group (alternate intervention vs no intervention), and type of work-related outcome (task/skill-based vs functioning) were significant moderators. These findings indicate that interventions can improve work-related outcomes with a small effect but due to the limited number of studies available and the range in measurement of outcomes, there is a clear need for further research to assess the effectiveness of interventions in the context of the workplace. Far transfer may provide a possible explanation for why skills-based interventions are a challenge to transfer to workplace contexts. For example, skills-based tasks may be relevant to the context in which they were trained such as organisation skills for paperwork. Therefore, to transfer these skills to contexts like the workplace where the role may not involve organisation of paperwork may be difficult. However, exploring whether there is far transfer is more of a challenge when study designs are of poor quality, using unreliable measures and not explicitly outlining the details of the intervention and how it was delivered which were all observed in the studies included in the review.

Practice Implications and Future Directions

Together with the systematic review, the findings highlight the necessity for future research outlining interventions to support ADHD to include a workplace component to the intervention and assess primary work-related outcomes using reliable and valid scales. Intervention research should assess the efficacy of the intervention on a range of outcomes including the three core symptoms of inattention, hyperactivity, and impulsivity plus skills-related outcomes as well as functioning in life and at work. In addition, studies should examine whether skills-based and cognitive behavioural therapies are applicable across contexts and demonstrate far transfer to the workplace.

Limitations

The main limitation of the meta-analysis is the small sample of studies included. Despite an extensive search of the literature, studies that assess the efficacy of interventions for adult ADHD tend not to assess primary or secondary outcomes related to the workplace which limits the generalisability of the findings. Indicators of publication bias showed there was a high likelihood of publication bias in the sample, this is reflected in the findings of no studies from grey literature. Publication bias is particularly difficult to reduce but needs to be addressed especially when involving studies that are used as part of evidence-based recommendations for practice. Furthermore, the variation in psychosocial interventions, such as the differences in mechanisms for cognitive training and online CBT lead to challenges with generalising the findings. A need for more robust research that assesses the efficacy of interventions for adult ADHD, including workplace outcomes with clear methodology and research design is evident from the findings in the present meta-analysis.

Conclusions

To conclude, although existing interventions for adults with ADHD are deemed effective for reducing symptoms of ADHD and general functioning, there is a small positive effect of any intervention on work-related outcomes. Workplace outcomes are often considered as secondary and skills-based interventions target general skills rather than specific work-related skills training. Therefore, an amalgamation of the chapter findings and evidence generated thus far, demonstrates a distinct gap in the literature that directly assesses the support available for adults with ADHD in the workplace and a lack of reliable and valid work-related measures that can be utilised to examine the effectiveness of interventions. As a result, it is unclear whether the recommended support for adults with ADHD at work is evidence-based and accessible for practitioners who advise employees with ADHD and the employees themselves.

Chapter 6 A template analysis of online workplace advice and support for adults with ADHD

Thus far, I have synthesised and aggregated the evidence-base regarding interventions and conceptualisations of ADHD in the literature. The EBMgt framework advocates that evidence consists of information from a range of stakeholders and decisions should not solely rely on one type of evidence (Barends & Rousseau, 2018). Reasonable adjustments are being implemented in organisations regardless of the lack of an evidence-base because of the need to support those with ADHD now and in the immediate future. As a result, this chapter collates the existing practical guidance in relation to adjustments and compares it to the findings from the literature, meeting the second aim of the thesis to compare research to practice. To examine practical evidence, a qualitative analysis of online workplace advice and support aimed at adults with ADHD was conducted. Hidden or invisible disabilities, including ADHD, are associated with high levels of stigma and a general lack of public awareness and understanding. Adults with ADHD are more likely to seek help and advice online. Online advice provides a confidential space for people to share experiences, learn from others and receive emotional and social support.

Context

As discussed in Chapter Two, there is a stigma associated with both the legitimacy of an ADHD diagnosis and controversy around the medication prescribed for adult ADHD (Fuermaier et al., 2014; Mueller et al., 2012). Therefore, adults with ADHD may recognise they have ADHD but be unlikely to seek a diagnosis because of shame or fear (Koro-Ljungberg & Bussing, 2009). No diagnosis can mean it is more difficult to access services and support in the UK and is likely to cause adults with ADHD to seek help from elsewhere (Young et al., 2011). Some adults may self-medicate with stimulants which have a similar effect to the ADHD medications but can be highly addictive (Sullivan & Rudnik-Levin, 2001). Others may look to confidential and anonymous sources of advice like the advice and support online, especially for health and career related advice (Noruzi, 2007). With the rise in online forums, much of the research has been conducted on the social support available online with little research focusing on the professional advice and more so, the quality of this advice (McKnight et al., 2007). I first discuss online help-seeking and why people may seek help online followed by whether the advice online can be trusted. I then discuss the research on online help and guidance and finish with why adults with ADHD may seek help online.

Online Help-seeking

The advent of the internet has led to an expansion in the sources of help from the social and interpersonal environment (Ybarra & Suman, 2006). Online or dynamic help-seeking can be defined as an individual using the internet (the source) to find information and resources to support themselves (the coping strategy) (Rickwood et al., 2012). The internet provides a platform for people to seek help anonymously, quickly and easily (Suzuki & Calzo, 2004). Statistics reveal that one of the most popular reasons for using the internet is to look for information, with over 40% of internet users indicating that the internet was their primary source for information (Ofcom, 2017).

Why Seek Help Online?

The reasons identified in the literature as to why people seek help online can be understood referring to two psychological needs: need for independence and need for belongingness (Nadler, 2014). The need for independence can be fulfilled in the confidentiality and accessibility of online platforms and the increase in knowledge that can be gained online. A study on adolescents found that the main reasons why pain management advice was sought online was to avoid embarrassment, increase independence, and to learn (Henderson et al., 2014). Furthermore, studies investigating adults' online help-seeking highlight that individuals sought to increase their knowledge of medical conditions or diagnoses for one of two reasons. The first reason was to gain knowledge to be better able to communicate with medical professionals (e.g. their GP) at their next meeting presumably to understand the diagnosis in more detail and the jargon associated with it (Sillence et al., 2007b). In addition, online information may provide confirmation of their diagnosis and is arguably more up to date than printed diagnostic criteria and guidance such as reports or leaflets (Caiata-Zufferey et al., 2010; Sillence & Briggs, 2007). The second reason is that some adults reported contextual restraints associated with medical professionals. For example, GPs have been reported to only discuss the core symptoms related to the medical condition so individuals sought knowledge online about their other symptoms, particularly experiences related to emotions or alternate treatments (Sillence & Briggs, 2007). Parents of children with ADHD also emphasise their need to have online advice that is easily understandable including shared experiences of other parents and adults with ADHD, and including question prompt lists that they can take with them to their next consultation (Ahmed et al., 2014).

The need for belongingness can be explained by the extensive support networks and forums accessible to share and seek advice online (Barak et al., 2008). In the context of health-related online advice, social support groups are argued to

facilitate social needs that may not be fulfilled in the non-digital world for example there is an increase in access to individuals with similar experiences and symptoms, lack of judgement on life experiences, and no visual social cues that can be misinterpreted in face to face interactions (White, 2002). Adolescents also report receiving empathy from online communities without the need for disclosure (Gray, Klein, Noyce, Sesselberg, & Cantrill, 2005).

In addition to psychological needs driving online help-seeking, contextual and individual differences play a role in seeking advice online as well. For example, in the UK, health services offer limited support and have long waiting lists resulting in people searching elsewhere for medical information (Sillence et al., 2007a). In contrast, a report based on a survey from Australia concluded that a lack of knowledge in where to seek advice for mental health was the largest barrier to accessing help rather than contextual, emotional or psychological reasons (Thompson, Hunt, & Issakidis, 2004). Individual differences such as the individual's understanding of disability using a medical compared to psychosocial model also impacted help-seeking with a medicalised perception leading to professional recommendations compared to friends and family (Pattyn et al., 2013).

Can People Trust Online Advice?

Whilst there are advantages of seeking help online (e.g. anonymity, social support and the easy access to knowledge), there have been concerns raised about the quality and accuracy of the advice online (Briggs et al., 2002). Advice is more likely to be accepted if the person providing the advice is perceived as an expert (Van Swol & Sniezek, 2005). In the context of the workplace, the expert is commonly perceived to be the manager (Nadler, 2014). For the help seeker, three determinants are understood to impact the likelihood of taking online advice, the advice must be perceived as credible, personalised, and predictable (Briggs et al., 2002). The advice must be credible in that it must be perceived to be from a knowledgeable expert and personalised in that the person should be able to adapt the advice to suit their needs. Finally, it should be predictable in that the advice must be like what the help seeker is expecting for example, related to experience or common knowledge.

There are several challenges with the credibility aspect of the three determinants discussed. Credibility and trust are closely linked but often discussed as either separate concepts or both terms are used interchangeably (Gray et al., 2005). The lack of a clear distinction between both has led to inconsistencies in the literature because conceptually they are difficult to measure and existing measures focus on different aspects (Sillence & Briggs, 2007). Despite this limitation, trust is mostly considered an individual difference and when applied to understanding the acceptance

of online advice both trust in general humanity and trust based on personal experiences have been suggested to influence the perceived credibility of the advice (McKnight et al., 2007). Credibility relates more to the sources of the information for example, whether the information is provided by an official website or by an impartial website influences whether the advice is accepted and this is further linked to personal preferences (Gray et al., 2005; Peterson, Aslani, & Williams, 2003). To illustrate, Peterson et al. (2003) identified that when searching for online treatment advice, participants preferred the advice from an impartial website like a university website compared to a pharmaceutical website. Organisational websites were classified as impartial sources in this case and were also perceived as credible depending on the individual. Therefore, the credibility and trust in online advice depends on the individual's levels of trust, their experiences, their personal preferences, and the source of information itself.

Studies investigating trust in online data tend to use qualitative methods such as in-depth interviews and group discussions, the advice itself has not been evaluated or concepts such as trust, online advice and credibility defined. Consequently, these concepts become intangible and research addresses only the perceived trust rather than the quality of the actual online advice as a unit of analysis.

When considering trust in organisational contexts, trust needs to be understood from two levels (McKnight et al., 2007). The first is the interpersonal level where there are individual differences in trust. The second level associates trust with the institutional identity where the wider identity of the whole organisation is considered a distinct social identity (McKnight et al., 2007). In organisational contexts, the institutional identity would depend on the industry, the employees associated with the company, and the company reputation. For instance, pharmaceutical and commercial websites were seen as less trustworthy and credible when exploring both medical and financial advice, due to the undisclosed but known motive to persuade the audience to consume a product or service (Sillence & Briggs, 2007). Hence, the concept of an expert and a credible company is largely dependent on their representation in the wider society and how they construct themselves online.

Research and Online Help-seeking

Research has tended to focus on why and how individuals seek help online and less so on the quality of information within the online advice. In the medical literature, one study explored the information provided for the health condition Fibromyalgia Syndrome and found that the information online acknowledged the experiences of the condition rather than simply stating the symptoms (Barker, 2002). The experiences provided individuals with a collective identity which supported their understanding and

acceptance of the health condition. In the business literature there has been a focus on who provides the advice rather than the quality, with experts and peers being the most frequent sources of online business and career advice about topics such as, business growth, performance, and economic risks (Kuhn, Galloway, & Collins-Williams, 2016; Nyarko, Schotter, & Sopher, 2006)

Therefore, the research discussed has examined how individuals seek health information, process and use it and has suggested that online support as well as guidance tends to be the first platform that adults seek information, social support and to help inform further communications with experts. Yet, there has been limited research that addresses the content and quality of the online guidance and support. In the health literature, there is a suggestion that online advice focuses more on the experiences rather than core symptoms although there has been little exploration of the workplace advice related to medicalized conditions (Gray et al., 2004). Furthermore, there is a lack of examination of how institutions represent themselves online and the relationship between this and the credibility of the advice.

ADHD, Stigma and Help-seeking- Why Adults with ADHD May Seek Help Online

The advent of the internet in addition to the increases in accessible technology has led to more people being able to access media using a variety of platforms. In relation to ADHD, media representations have been fundamental in influencing the public's awareness and knowledge of the condition. Social representations of ADHD, in particular, media framing have been described as a catalyst for stigma (Schmitz et al., 2003). Media framing is defined as "a process by which a communication source constructs and defines a social or political issue for its audience" (Nelson, Oxley, & Clawson, 1997, pg. 221). A content analysis of both newspapers and reports explored media representations of ADHD over a period of 10 years (between 1988 and 1997) (Schmitz et al., 2003). Findings revealed that the core symptoms of ADHD were also the most frequent representations of ADHD in the discourse. Visual representations were mostly photos of middle-class white boys and the children's character, Denice the Menace, arguably associated with the misconception that ADHD is a 'naughty boy syndrome' (Schmitz et al., 2003). The review concludes that over time the representations have become less stigmatised and have attempted to encourage the normalisation of ADHD. There has also been a shift over time to less reliance on medical sources of information alongside a change in interest from the causes of ADHD to the treatments available.

A further review of media representations of mental disorders found similar associations with a shift away from the medical definitions of conditions towards a focus on empathy (Ray & Hinnant, 2009). This shift towards understanding mental

health in a more positive way, towards the social model, is much like the contextual shifts discussed in Chapter One regarding ADHD. Although there were some aspects that did not change over time and these included the informed tone and themes of suffering, the medical model (Garland-Thomson & Holmes, 2005). There were themes of suffering with individuals with ADHD being framed as victims of their condition or framed as trivialising ADHD. In addition, the authors considered ADHD as a mental disorder in the article, which is not an accurate categorization of the condition, they concluded that there was inconsistency in the definitions of mental disorders.

As a result of the contrasting media representations and the stigma associated with ADHD, adults with ADHD are likely to seek advice and support from a confidential and anonymous source, most likely online (Noruzi, 2007). The recent shift in online information focusing on the treatments for ADHD raise the need for the advice to be examined to identify any similarities and differences between the information online compared to the recommendations from the research.

Existing research highlights a gap in research whereby there is little research analysing the online advice itself. As a result, more is known about how advice is perceived rather than the actual quality. To investigate the quality of advice it is necessary to compare the advice online to the existing evidence-base. In addition, employers are already having to make reasonable adjustments for adult ADHD based on a lack of evidence found in the systematic review (Chapter Four). Therefore, it is important to assess whether there is an evidence-base that practitioners are drawing on that may be online.

Building on the conclusions from the introduction chapter and systematic review that suggest the divide between researchers and practitioners in relation to organizational psychology (Anderson, Herriot, & Hodgkinson, 2001) and the fragmentation of research addressing ADHD, it seems appropriate to examine advice online because the internet is a platform that can bridge the gap between research and practice (Hoss & Hanson, 2008). It is also recommended that for best practice, practitioners require an evidence-base which can be translated into practice. I build on the research findings in the systematic review for these reasons (Briner & Denyer, 2012; Hoss & Hanson, 2008).

Research Question

What advice and support are available online for employed adults with ADHD? To what extent does the online advice reflect the a) workplace challenges and potential strengths associated with ADHD, and b) the support needed/ interventions for employed adults which are both documented in the peer reviewed literature?

Method

Template Analysis- a Priori Template

Template analysis is defined as a method of categorising the themes in a thematic analysis where a template can be applied to the data (Cassell & Bishop, 2018). An advantage of template analysis is that it is a flexible method allowing for a priori and emerging themes (King, 2004). In addition, template analysis is beneficial for those exploring the different perspectives and approaches in organisations which is relevant to the type of advice in the present study (King, 2012). An inductive, data driven approach to thematic analysis was adopted mainly because of the need for flexibility and a priori themes being developed from the existing literature so to avoid researcher bias during analysis (Clarke, et al., 2016).

To address the research question, an a priori template (see King, 2014) was developed based on the findings from the systematic review. The template included challenges and strengths of ADHD as identified from the literature and any advice suggested to support adults with ADHD at work. For example, interventions included medical, psychosocial, combined with mechanisms like self-management or person-centred. The a priori template is displayed in Table 6.1.

Table 6.1

The a priori template

1. Documented challenges	3. Interventions	4. Legality
1.1 Medical	3.11 Medical	4.11. Reasonable adjustments/accommodations
1.11 Core symptoms	3.12 Psychosocial	4.12 Legal responsibility
1.12 Executive functioning	3.13 Combined	
2. Potential strengths	3.14 Self-management	
2.1. Social	3.15 Person-centred	
2.11 Society views	3.16 Peer support	
2.12 Strengths-based		

Process of Collecting Online Data

There is limited guidance for researchers on how to conduct internet research especially in relation to how to collect data (Gosling & Mason, 2015; Pritchard & Whiting, 2012). Data were collected through a search of a website search engine

using predetermined criteria and search terms adopting a search process similar to a systematic review. The search was conducted in May 2018.

Search Terms

Due to the ever-increasing volume of information available on the internet, specific search terms were entered into the search engine 'Google' with the aim to narrow to the most relevant results. The search terms were: "*adult ADHD*" AND "*employment or workplace*" AND "*support*" OR "*advice*" OR "*guidance*". The terms were entered using advanced search which ensured that the results included all of the above phrases.

Inclusion Criteria

The first 100 websites were compared against the inclusion criteria. To be included they had to provide support or advice about supporting adults with ADHD at work or in employment and be intended for public consumption. For example, support forums were excluded for ethical reasons relating to the ambiguity of the writer intending for their posts to be public or private (Whiting & Pritchard, 2017). Websites could be related to any country but had to be written in English.

Data Collection and Management

The search terms were entered into the search engine Google and then filtered according to the inclusion criteria. According to King (2004) template analysis typically compares the perspectives of 20-30 participants, therefore, each website was classed as a different perspective and a total of 20-30 websites were deemed appropriate. The websites were stored and managed using the software package NVivo and saved separately as PDF files. Any sounds and or videos were transcribed and stored as a separate but linkable document.

Internet Research and Ethical Considerations

The use of internet research raises two key challenges. The first challenge is defining what a unit of analysis consists of and the second is the ethical considerations associated with internet research. Internet research is a general term that encapsulates both primary and secondary data sources collected online. For example, primary internet data can be interviews using an online video communication platform like Skype and secondary internet data can be social media posts (Hewson et al., 2015). Consequently, it can be a challenge to define the units of analysis in research and conscious decisions about whether to include sounds, texts, videos need to be made. In the present study the unit of analysis is the website itself including any text, images and sounds that are present on the website at the date of data collection. Any advertisements were included as these may provide insights into the context of the

advice. For instance, organisations may promote their own recommendations in adverts.

In regard to internet research ethics, the study was informed by the considerations outlined by Whiting and Pritchard in 2017. Determining whether there is human participation needs to be considered because participation requires informed consent. In the context of the present study, there is no contact between the researcher and the employees associated with the websites related to organisations (Townsend & Wallace, 2016). In addition, the inclusion criteria selected websites where their purpose is to provide workplace advice. Therefore, their intended audience is the general public limiting the need for informed consent and consideration of whether the intention of the content owner was to provide advice publicly or privately (Markham & Buchanan, 2012).

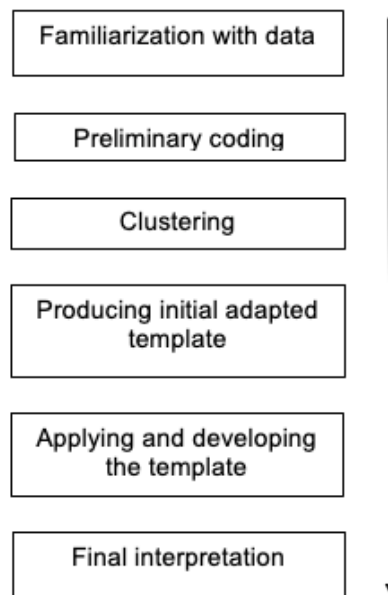
Analysis

There are several qualitative approaches that can be applied to interpret internet data because of the variations in types of information online, from social media posts to stock photographs (Pritchard & Whiting, 2017). Since the aim of the research was to compare and contrast the findings from the literature with the online data, the analyses deemed most appropriate was a template analysis (King, 2004). Consistent with the critical realism throughout the thesis, a critical realist ontology is adopted. Hence, the use of a template lends itself well to this approach because it aims to be linked to theory and prior research whilst accepting that the interpretation is subjective and reflexivity is important (King & Brooks, 2016).

The first step of analysis was to construct the a priori template from a review of the literature (Introduction) and the findings from the systematic review (Chapter Four). The following steps of analysis are based on King and Brooks' (2016) approach to template analysis and consist of familiarisation with the data, preliminary coding, clustering of themes, producing an initial adapted template, application and development of the template, and finally the final interpretation of the template. See Figure 6.1 for a visual depiction. Template analysis reveals common themes and sub-themes that arise in the data, firstly with the individual websites themselves and then secondly with the websites as a whole. These themes were then organised in a hierarchical system to identify the overarching or higher order themes and the related but lower order themes. For example, the overall definition of ADHD was considered a higher order theme with the difference definitions as lower order themes (mental health condition/neurological condition). As a result of the potential stigma and labelling associated with ADHD, conceptualisations of ADHD were also coded and included as part of the template analysis (Pritchard & Whiting, 2014).

Figure 6.1

Steps of template analysis



Note. Adapted from “Template analysis for business and management students,” by N. King and J.M. Brooks, 2016, SAGE Publications Ltd.

Data Overview

The data coding process was based on 27 websites containing online advice. The majority of websites ($k = 11$) were categorised as both medical and commercial, mostly promoting medical products, and included a range of suggestions for support, lists of challenges, and noted strengths associated with ADHD. Other websites were part of non-profit organisations, specifically targeting ADHD ($k = 3$). See Table 6.1 for more detail on the websites included in the analysis.

Interestingly, two of the websites made clear that adults with ADHD wrote the content with one containing a video of an interview with someone who says they have ADHD and another where the writer of the article explains that they have harnessed their ADHD strengths. A third website article was written by Edward Hallowell who is well known in America through his work as a psychiatrist working to support those with ADHD whilst having a diagnosis himself (Hallowell, 2020). There is some evidence that when content is produced by those with similar experiences, it is trusted more because it creates a sense of community and shared understanding, reducing the implicit power structures from expert and novice to mutual shared experiences (Briggs et al., 2002; White & Dorman, 2002). Content created by those with ADHD highlights the importance of lived experiences in providing advice which is omitted or neglected in clinical research (Sacristán et al., 2016).

Visually, most of the websites were very text heavy, with only three websites using other formats such as video, radio podcast, and online newspapers, which is not in line with general advice. In addition, strategies were typically presented in long lists or long paragraphs of text. Based on what is known in the literature, the online advice is arguably not presented in the most engaging way for those who have challenges with attention, distraction, and concentration (Ramos-Quiroga et al., 2013). Instead, research has suggested that information should be presented in short parts (Barkley, 2013). Plus, there was an overall lack of images and colour despite some of the recommendations for ADHD emphasising the importance of using colour and visual techniques to communicate information (Gaines & Curry, 2011; Ostoits, 1999).

A contextual overview of the dataset is provided below followed by a discussion of the key themes extracted that examine the support suggested for employees with ADHD followed by the themes extracted which combine the strengths and challenges associated with ADHD.

Table 6.2

Included websites with their representative page title, type of organisation, and author

Website	Title	Organisation	Author
1	13 Tips for Working with Adult ADHD	Health-related (provides online wellness information and resources)	Freelance writer for the organisation, has been medically reviewed by an expert in anxiety and asthma
2	47 Hacks People With ADD/ADHD Use To Stay On Track	Online news provider	Journalist 'staff writer'
3	7 Tips To Do in the Workplace for an ADD/ADHD Adult	Medical and health-related (provides online medical, health and nutrition information)	Organisation- video format
4	ADHD- overwhelmed at work- advice & tips for employees	Medical (pharmaceutical company)	Organisation
5	ADHD at Work by the Numbers	Not-for-profit (ADHD specific)	Workplace committee in organisation
6	ADHD in the Workplace	Not-for-profit (ADHD specific)	Organisation
7	ADHD in The Workplace	Mental health related (provides online information on mental health)	Child and Adolescent Psychotherapist (not specialised in ADHD)
8	ADHD in the Workplace	Productivity training provider	Journalist interview with a work coach

9	ADHD in the Workplace: Solutions and Success	Mental-health related (online support network)	Associate editor (specialising in eating disorders)
10	Adult ADHD and Work Performance	Healthcare provider (network of physicians)	Organisation
11	ADHD in the Workplace	Medical news provider (online)	Organisation
12	Disorganization at Work with Adult ADD/ADHD	Webinar providers (ADHD specific and free)	A member who runs the webinar interviewed an ADHD marriage expert
13	Adult ADHD- a performance management issue	Legal news provider	Employment lawyer
14	Adult AD/HD in the Workplace	Neurodevelopmental assessment centre	Organisation
15	Are You One of Us? Adult ADHD & Career Success	Job advertisement and recruitment	Resume expert (with ADHD)
16	Attention Deficit Hyperactivity Disorder (ADHD) in the Workplace	Online business magazine	Academics (specialising in management and diversity)
17	Career Masterclass: How to manage ADHD in the workplace	HR recruitment provider	Psychiatrist (with ADHD)
18	Job accommodations for adults with ADHD	Mental health-related (online information provider)	Staff writer (medically reviewed by a Psychiatrist specialising in PTSD and workplace issues)
19	Managing a person with ADHD: working with energetic by frustrating people	Management and leadership related (online advice provider)	Organisation
20	New research finds undiagnosed adult ADHD could cost billions every year	Political not-for-profit (online magazine)	Communication assistant

21	Adult ADHD- Hidden Diagnosis	Social work magazine	Freelance writer (specialising in social care and health)
22	Sit-stand desks and the other workplace 'game changers' for ADHD adults	Physiotherapy provider	Marketing team
23	Focusing on Adult ADHD in the Workplace	Psychiatry association	Organisation
24	Tips for Managing Adult ADHD	Mental-health related (online evidence-based information)	Organisation
25	Dealing with Adult ADHD when managing performance	Legal association	Organisation
26	Pam Loch: Adult ADHD symptoms need careful handling	Newspaper	Employment Lawyer
27	Adult ADHD In The Workplace	Mental-health related (online group that provides support)	Organisation

Template Development and Refinement

The final template was adapted considerably and iteratively from the a priori template because the themes generated from the literature did not reflect the themes extracted from the online data (King, 2012). The a priori template was structured around higher-order themes about a) general ADHD support like medicine (stimulants) and psychoeducation identified from the systematic review (see Chapter Four) as well as higher-order themes reflecting the challenges for and strengths of adults with ADHD documented in the literature review in Chapter Two. This a priori template was applied to the first three websites that were identified as part of the search by coding the relevant data to determine to what extent this coding process would align to the higher-order themes (King & Brooks, 2016). Even at this initial stage the coding process made apparent that the themes needed considerable review. For example, the a priori themes included medical support for ADHD which was not mentioned in the online advice which instead focussed on specific work-related support activities. The revised template was then applied to an additional subset of the data before the complete dataset (King & Brooks, 2016). Subsequent amendments to the working template were made continuously and iteratively through a continuous comparison of codes and themes (King, 2012). Once the data were coded the template was finalised and applied to the data to ensure it accurately reflected the themes and codes in the analysis (King, 2004) (see Appendix 4.2).

Analysis and Discussion

The following section details the analysis of the data structured around the two main research questions. Rather than present the themes first and then discuss the literature, the analysis and discussion are combined to allow for detail in the divergence between the empirical evidence and the practical guidance. The analysis is illustrated with quotations from the data to provide concrete examples which were selected based on how well they illustrated the associated themes and interpretation. Two prominent assumptions which cut through all themes were interpreted from the data.

Assumption One: Misconceptions About ADHD

The first was the common reference to ADHD as a mental health condition, with some websites positioning ADHD in the mental health section of the website. This does not reflect that ADHD is formally classified as a neurodevelopmental disorder, like autism, because of the differences in the development of the brain from childhood (Moffitt et al., 2015). False information observed in the websites demonstrates the general lack of public knowledge about what ADHD is and how it can be treated. The

content was typically created by non-experts in ADHD who did not use recent research to inform their recommendations.

Assumption Two: The Position of the ‘Expert’

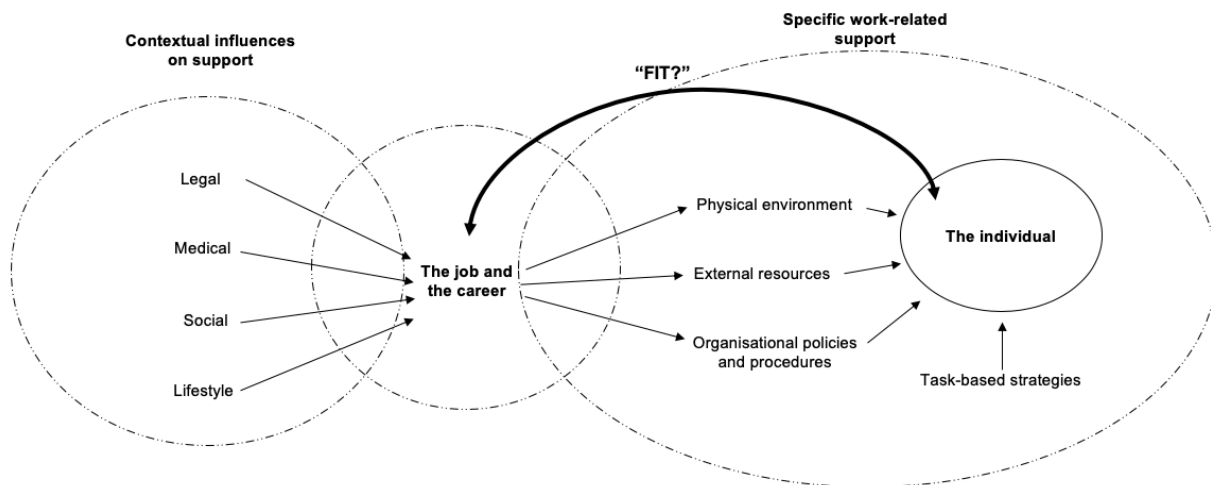
The second assumption was more subliminal and related to the positioning of the expert and the person with ADHD. A total of three articles were labelled as “*medically reviewed*”. Investigating the biographies of the people who reviewed the websites revealed that none were experts on ADHD, one was a psychiatrist specialising in PTSD, one an expert in anxiety and asthma, and another in child neurology. Further to the medical reviewers, other named experts included a productivity, resumé, and ADHD marriage counsellor. The training and specialist knowledge associated with these types of expertise is unclear. Although none of the experts or medical reviewers specialise in ADHD in the workplace, using the position of the expert arguably places more weight and influence on the content of the advice (Van Swol & Sniezek, 2005). Furthermore, the advice is more likely to be followed and trusted if it is believed to be from an expert (Briggs et al., 2002). Information is also more likely to be remembered (Klucharev et al., 2008). Use of the expert position is in line with French and Raven's (1959) theory of power bases where expert power is a form of power that can influence and change people's behaviour. The theory places emphasis on the idea that the recipient does not need to fully understand the advice to follow it; they simply need to believe that the expert has superior insight or knowledge on the topic (Raven, 2008). Therefore, by using the social position of the expert providing advice, the websites tried to be more persuasive. However, over a quarter of them are websites created to promote medical products like apps and medicine. Furthermore, although the increasing use of the internet for health advice has decreased the gap between medical experts and layperson, ADHD as an adult diagnosis is relatively new and could be at higher risk of misinformation.

Online Advice and Support

The final template contained five overarching themes of support included on the websites: external interpersonal resources, task-based strategies, environmental adaptations, organisational procedure and policy, and finding the right career. These themes and the relationships between them are depicted in a conceptual map, see Figure 6.2.

Figure 6.2

Map of themes from analysis



External Interpersonal Resources

The most prominent theme that was elicited was the emphasis placed on an ADHD employee's social network for workplace support including the manager, colleagues and, a career coach or mentor. The role of the manager was particularly striking because of the wide range of knowledge and responsibilities that was expected of them. Managers were expected to have awareness of the diagnostic process for ADHD and advised to recommend seeking a diagnosis for those undiagnosed or medical advice for those diagnosed. They were also expected to know about reasonable adjustments. The current diagnostic procedure for adult ADHD is a lengthy process with only clinical psychologists and psychiatrists able to provide formal diagnoses and the waiting lists for a diagnosis on the NHS are averaging over 13 months long (ADHDAction.org, 2020). Yet, this information is not described in the online advice which gives the impression that diagnosis and support are available immediately and for all. To illustrate, a quote from one website reads "you can help a team member with ADHD succeed with a few simple accommodations in the workplace, and by thinking about your approach as a manager".

In relation to providing support whilst in the workplace, managers were advised to take a situational leadership style adapting their style to the employee with ADHD, provide appropriate feedback, provide structure, reminders, and even "*provide creative roles*". One website stated "by understanding and wishing to address the symptoms displayed by ADHD adults that their employees might exhibit, managers have a better chance of determining when it is best to use different situational leadership styles". In reality, most managers have limited opportunities for leadership training and there is a

lack of research evidence on how adapting leadership styles impacts employees with disabilities. The research on leadership styles even argues that not all managers are able to adapt their styles accurately to situations (Zaccaro et al., 2018).

The role of the supportive colleague or buddy also involved providing reminders during the day so the employee with ADHD can remain on task. It was recommended that colleagues structure projects for the employee with ADHD and then monitor the progress. To achieve this recommendation, the colleague would have to know what ADHD is and how best to support ADHD at work. Of course, following this recommendation also involved additional work, which not every colleague is willing or able to do. To address this challenge one website argued that the employee with ADHD could “frequently offer a return favor such as doing a job for him that he doesn’t like doing”. Conversely, one article mentioned disability awareness training for all colleagues. There is less focus on the relationship between the employee with ADHD and their colleague and instead the colleague is positioned in a parent-like role. This positioning of the ADHD employee as less responsible and helpless contributes significantly to the stigma associated with ADHD (Mik-Meyer, 2016).

Coaching and mentoring were briefly mentioned to mostly work on the emotional and social challenges associated with ADHD. In one article the coach was advised to work to strengths. Information relating to how coaching and mentoring are effective on emotional and interpersonal aspects was less clear and no evidence was used to support these points. There is some evidence from the literature to suggest that mentoring and coaching can support emotion and social aspects, but emphasis tends to be placed on the coachee or mentee actively participating in finding solutions rather than what seems to be proposed in the online advice where the mentor or coach teaches the employee with ADHD how to cope/ behave in social situations (Chung & Gfroerer, 2003). In addition, there is a wider debate around the role and distinction between what a work coach and work mentor support- is it performance, advice, education or work-like decisions (Johnson, 2003; McComb et al., 2007; Ragins & McFarlin, 1989)? Plus, it creates complexity to explore work-related challenges without acknowledging the coachee’s personal and non-work related experiences (Sheath, 2013).

Task-related Strategies

The theme titled, task-related strategies, was formed from sub-themes relating to strategies that the employee would use for specific tasks once in work. The subthemes were reward-based systems, memory techniques, organisation tools, and time-management tools. These strategies were all targeted at the challenges associated with organisation and time-management and were the most common

across all the websites. As a whole, these strategies promote self-management of ADHD often providing little detail of how these strategies would be implemented and are almost all only relevant in an office context. Examples of the strategies are presented alongside the theme below. There is an argument that these strategies need to be switched often to reduce boredom, which is unique to ADHD, although this is not discussed in the online advice (Ostoits, 1999). These strategies also highlight the challenges with working memory and emphasise the importance of rewards for short term goals both less discussed in the literature.

Table 6.2

Subthemes and their representative strategies

Subtheme	Strategies
Reward-based systems	Rewards in short term for small goals, tracking progress
Memory techniques	Memory training, technology, record meetings, written instructions, reminders
Organisation	Colour coding, break tasks down, tracking progress, note taking, 'avoid procrastination'
Time-management	Calendars, planners, bullet journal, timers

Alterations to the Physical Environment

Similar to the task-related strategies, the theme alterations to the physical environment included advice for the office environment. These suggestions were based on minimising distraction for the employee with ADHD but conversely some suggestions were positioned as stopping the employee with ADHD distracting their colleagues. Examples include closing the office door, having a dedicated desk, standing desks, desk organisers, and noise cancelling headphones. Alterations to the physical environment is in line with the law that adjustments should be made to the environment rather than to the individual further promoting the social model of disability. Although the theme shows that organisations are attempting to address the environmental barriers rather than the individual, these were not the most common adaptations. They are, however, simple adaptations and support the argument in the literature that alterations to the environment are often cheap and easy to implement in contrast to employers' assumptions about reasonable adjustments (Jackson et al., 2000).

Organisational Policy and Procedures

Websites suggested changes to how work is structured and conducted as part of the support for employees with ADHD. Flexible working, part-time work, working from home, and job sharing were all suggested to support ADHD by reducing workload and maintaining a level of autonomy. These organisational policies have been demonstrated to be beneficial to all employees and are not limited to those with ADHD (Joyce et al., 2010). However, mentioning that these policies are helpful to many was only mentioned in one of the websites: “Very often, when there are attempts to accommodate a specific group of people within an organization, the results have a positive impact on the entire workforce.”

Similar to the minimisation of distractions mentioned above, advice to employees with ADHD was to work when no one else was at work. An example from one website to illustrate explained the employee with ADHD must “Figure out when most people are gone and work then. Common times to try include early mornings, late nights, weekends, holidays, and lunch hours”. Not only is this impractical for most organisations and detrimental to any employee’s productivity and well-being to be isolated from their colleagues, it contributes to stigma seemingly associating the employee with ADHD as a distractor that needs to be removed for the benefit of others (Fuermaier et al., 2014).

Organisational procedures included project sharing or only taking on short-term projects, linked to the need for short-term rewards. The final procedures are argued to support the hyperactivity and impulsivity aspects of ADHD and involve suggestions to take frequent movement breaks and emotion breaks when feeling overwhelmed. Feeling overwhelmed is highlighted in the literature to be associated with sensory overload but also includes the emotional regulation of those with ADHD. These changes to procedures are very important for all types of neurodivergence and disability. Thus, organisations should be considering these as part of their diversity policies and practices (CIPD, 2018; 2019).

The Right Career

A familiar narrative throughout a large proportion of the websites was the suggestion that little to no support is required if the employee with ADHD is in the right job. The ideal or right job is described as a role that matches the employee’s interests and strengths often related to the common strengths associated with ADHD. Specific jobs mentioned were creative roles and a career as an entrepreneur. This argument is in line with the person-environment fit theory that posits that the better match of the individual’s personality to their environment, in this case the organisation, the better outcomes for the employee and the organisation (Holland, 1959, 1997). The research

on whether better fit leads to better outcomes is equivocal due to the wide range of conceptualisations and methods of defining and measuring fit (Hoffman & Woehr, 2006). Therefore, simply having the right job is reductionist and in reality, it is a multilevel concept that requires a personalised approach (Jansen & Kristof-Brown, 2006). There is, however, research that supports utilising strengths and interests to the benefit of the employee and the organisation (Hodges & Asplund, 2010).

Challenges and Strengths

A total of five themes were extracted from the online advice that categorised both the challenges and strengths. These were labelled the following a) cognition, b) movement, c) task-related, d) interpersonal, and e) intrapersonal.

The theme, cognition, encompassed behaviour associated with the core symptom of attention regulation and included challenges with *focus*, *forgetfulness*, and *mind wandering*. The strengths related to cognition reflected the ones documented in the literature including *innovation*, *imagination*, *hyperfocusing*, *dynamic problem solving*, and *divergent thinking* (Sedgwick et al., 2019). Average to above average intelligence was also included in this theme and was often referred to as a '*myth buster*' in an attempt to reduce the stereotypical view that people with ADHD have below average intelligence. The literature also notes that people with ADHD do not have low intelligence as a strength of ADHD to reduce the misconception that poor performance at school is indicative of poor ability (Lange et al., 2010; Sumner & Brown, 2015).

The second theme was entitled movement, commonly referred to in the literature as the core symptom of hyperactivity, resulting in behaviour like fidgeting and feeling restless (Bjerrum et al., 2017). There were some strengths associated with movement such as *high energy*, *enthusiasm*, and *strong work ethic* and these were seen as beneficial to the employee and the organisation. These strengths are also mentioned briefly in the literature (Lasky et al., 2016; Sedgwick et al., 2019).

A third theme, the most prominent in both the literature and online advice, was task-related strengths and challenges. Similar to the support advice, challenges were related to time-management and organisation: *procrastination*, *missing deadlines*, *frequent lateness*, *boredom*, *increase in mistakes/accidents*, and *overall poorer performance/productivity*. Strengths related to tasks included finding the right role where *interests* can be utilised and others included *multitasking*, *persistence*, *willing to learn*, and *high productivity*. There is a juxtaposition presented here with both poor productivity being reported as a challenge and high productivity being reported as a strength. Both highlight the dominating narrative that being in the right job that plays to strengths is a solution to producing more work and increasing performance.

Interpersonal and intrapersonal communication were chosen as labels for the final two themes. Although they are both forms of communication, interpersonal is communicating with others and intrapersonal is inner thoughts and feelings (Steinberg, 2007). Challenges with communicating with others were explained as a common challenge in employees with ADHD mostly challenges with *interrupting* others leading to *arguments* with colleagues. There were more strengths reported by employers who have worked with someone who has ADHD these were *fun, charm, compassion, and humour*. The main intrapersonal challenge was managing strong emotions which is often referred to in the literature as emotional regulation, a behavioural response to impulsivity (Corbisiero et al., 2017).

A second challenge was *low self-esteem* which is prevalent across the literature too and explained as a direct result of negative experiences in life that are common with ADHD- most often school-related (Bramham et al., 2009). These experiences are detrimental to an individual's self-esteem, but there is an argument emerging from the literature and documented in the guidance online that people with ADHD can build *resilience*, a final strength (Gray et al., 2016; Sedgwick et al., 2019). Finally, it is worth noting that strengths were mentioned in 19 of the 27 articles, whereas they are much less documented in the empirical literature.

Comparison Between the Literature and Online Advice

The findings from the systematic review revealed that medication was the most researched method of support for adults with ADHD when in contrast, the online advice did not focus on medication. Instead, the online advice took a more practical approach and focused on short-term strategies and solutions that minimised challenges associated with behaviour resulting from the core symptoms rather than the symptoms themselves. These differences reflect the cognitive-behavioural model of ADHD which argues that core impairments in attention, inhibition, and self-regulation (impulsivity) can lead to failure to utilise compensatory strategies like organising, planning, managing procrastination, avoidance and distractibility (Safren et al., 2004). The model also places emphasis on the role of social environments, in particular previous experiences in forming dysfunctional cognitions and beliefs which consequently impact emotions. Therefore, the guidance online reflects the behaviours that result as a direct consequence of the core symptoms and highlight the workplace as a vital social context in influencing cognitions and emotions plus utilising strategies to cope. It could also reflect that the majority of the authors are not psychiatrists and not qualified to provide medical advice. It should be considered however, that many of the strategies suggested are effective for all employees rather than those with ADHD with flexible working being an example (Joyce et al., 2010).

Another difference between online advice and the literature was that there was a stronger focus on the strengths associated with ADHD in the online advice suggesting an attempt to shift the narrative to be more in line with the social model of disability. Further examples of reducing stigma and shifting understanding was that some of the websites included lists of *common myths* related to ADHD such as “*an excuse for laziness*”, “*medication is the only way to solve my ADHD*”, and “*not a real medical disorder*”. However, this acknowledgement of strengths was inconsistent in the online advice with eight websites not mentioning strengths at all. As a result of the stigma associated with disability, employees are less likely to disclose a disability and therefore unlikely to request reasonable adjustments (McDowell & Fossey, 2015). Although there is minimal research exploring experiences of disclosure and reasonable adjustments at work specifically in employees with ADHD, some of the websites mentioned disclosure as a barrier to employees sharing their ADHD with employers.

A final difference is that the systematic review identified a small evidence base demonstrating that psychoeducation is effective for adults with ADHD and there is no mention or explanation of psychoeducation in any of the websites. Ultimately, this illustrates the divide between research and practice because of the lack of ADHD work-related experts providing evidence-based online advice.

In contrast, there were some similarities between the online advice and the literature. First, both placed importance on social resources, supportive people around the person with ADHD, and suggest they impact challenges with ADHD that are distinct from the core symptoms. To illustrate one website stated, “Find a friend. If you confide in a co-worker that you have adult ADHD, he will most likely be willing to help you”.

Second, the support is not contextualised in either the research or the online advice. The systematic review found no studies that were specifically looking at ADHD in the workplace with only one simulating a workplace environment in a laboratory (Wigal et al., 2010). The online advice was arguably more contextualised with strategies specific to the workplace, but the majority were only relevant to office environments. Therefore, the applicability of support to different workplace contexts remains a gap in both practice and the literature.

Finally, a similar observation between both the online advice and the literature is that there is a clear lack of explanation around how different support works. In the systematic review, detail of the methods involved in providing support such as coaching was lacking. Similarly, the online advice was mostly presented in lists, with task-based strategies being the most prominent rather than describing how someone *avoids procrastination*. It seems to be assumed that the recipient of the advice, the employee with ADHD, would just know how to execute the recommendations. The lack

of explanation of how and promotion of self-management techniques instead contrasts the narrative that an employee with ADHD is helpless and unreliable needing the support from another (Hesslinger et al., 2002). These differences demonstrate there is a lack of knowledge and research on adult ADHD, especially in the workplace, that is both holistic and practical.

Limitations

The cross-sectional data used in the present study is a limitation because information on the internet is continually changing and updated, which means that some of the websites no longer exist or have changed their content. A second limitation is that it neglected to examine how the information was received by employees with ADHD and their respective employers. For example, it is unknown which advice would be trusted more based on the included websites. Future research could examine how the online advice is accepted or understood by employees with ADHD because research suggests it could vary depending on the presentation or expertise. Further exploration of the usefulness of practical and evidence-based resources online could also assist in bridging the research practitioner divide.

Conclusions

To summarise this chapter's findings, the advice and support available online identifies managers and colleagues as having an important supportive role assuming they are aware of what ADHD is and how to work best with an employee with ADHD. The online advice additionally provides a range of task-based strategies that can be utilised to avoid common challenges associated with ADHD, such as organisation and time management. It also recognises the importance of how the environment and policies/procedures can be adapted to better support employees with ADHD. Specific advice related to reasonable adjustments and the legal context is less clear, especially with regards to disclosure.

This chapter and those preceding have synthesised, appraised and weighed the evidence from research and practice that outlines interventions and adjustments for adults with ADHD. The evidence-base generated is applied to develop and evaluate an adjustment for adults with ADHD in the following chapters. A similar finding from the evidence-base is that managers and colleagues have a vital role in supporting adults with ADHD at work and this is mirrored in literature demonstrating the effectiveness of psychoeducation and involvement of the social network. Furthermore, existing evidence relies heavily on the medical model of disability which involves interventions at the individual level in clinical contexts which lack applicability to the workplace. As a result of these findings, it is clear that there needs to be focus placed on adapting the environment when implementing reasonable adjustments, in line with the law.

Consequently, this thesis adopts a social model understanding of ADHD and contributes to the final aim by developing an adjustment which targets change at those around the individual. In the work context, as highlighted in the present study, those targeted are managers and HR professionals who are key gatekeepers in the granting of reasonable adjustments.

Chapter 7 An investigation of the predictors for granting of reasonable adjustments in a sample of UK HR professionals and line managers

Chapters Seven and Eight discuss primary data collected from a sample of HR professionals and line managers. The preceding chapters have identified a lack of knowledge about how best to support employees with ADHD in the workplace but have highlighted the role of the social network in providing support. Therefore, in line with the social model of disability and the legal requirement to adjust the environment rather than the individual, this chapter investigates the key gatekeepers in the adjustment process. The purpose is to build on the evidence collated thus far and apply this to designing and evaluating an adjustment, contributing to the third aim of the thesis. The first step, and the contents of Chapter Seven, is to examine whether predictors of reasonable adjustment granting found in prior research apply to adjustments related to ADHD. The following chapter, Chapter Eight, examines the efficacy of an e-learning programme on the same sample that aims to increase knowledge about reasonable adjustments and ADHD and improve the decision-making process. Models of decision-making are described in more detail below including the different predictors included in the present study.

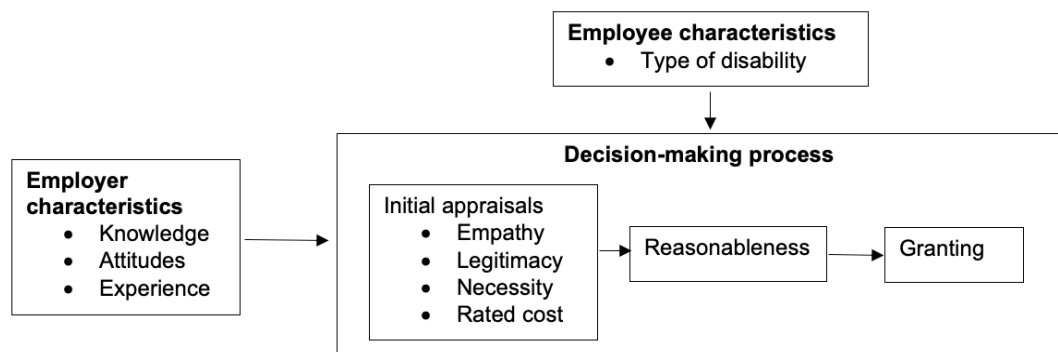
Models of Decision-making

There have been various attempts to create a conceptual framework of the decision-making process for granting adjustments. Each of these models commonly consist of three influential categories: the employers characteristics, the employees characteristics, and the perceptions of the adjustment and were formed from examining legal cases rather than being theory-led (Balsler, 2007; Lee, 1996; Stone & Colella, 1996). Due to the psychological nature of the employer characteristics (attitudes and intentions), researchers turned to psychological theories of decision making to examine how they can be applied to the granting process (Florey & Harrison, 2000). Components of the theory of planned behaviour (TPB), a theory from the social psychology literature, have been assessed in the context of this decision-making process (Florey & Harrison, 2000; Telwatte et al., 2017). Broadly, the theory of planned behaviour holds that attitudes, group norms, and perceived control predict intentions which in turn predict behaviour (Ajzen, 2011). It was theorized that attitudes towards adjustments and the disability, plus the perceived obligation to make adjustments, would predict whether or not they were granted (Florey & Harrison, 2000). Telwatte et al. (2017) expanded the model to investigate the differences between psychological and physical disabilities finding that perceived reasonableness and necessity were the strongest predictors of whether an adjustment is granted. Other predictors included

empathy on behalf of the manager, legitimacy, and perceived cost which were related to judgements of reasonableness. To extend this work and further examine the decision-making process, the present study collects qualitative data involving the justifications and explanations of why managers and HR professionals make the decisions they do (Jackson et al., 2000). A synthesis of the key components of the model are displayed in Figure 7.1.

Figure 7.1

Telwatte et al.'s theoretical model of decision making



Note. From “Workplace Accommodations for Employees with Disabilities: A Multilevel Model of Employer Decision-Making,” by A. Telwatte, J. Anglim, S.K.A. Wynton, and R. Moulding, 2017, *Rehabilitation Psychology*, 62(1), p. 4 (doi: 10.1037/rep0000120). Copyright 2017 by the American Psychological Association.

Employer Characteristics

Employer characteristics can be defined as characteristics within the individual that impact their intentions and thus their knowledge, attitudes and experience of disabilities in general (Stone & Colella, 1996; Telwatte et al., 2017). Understanding these individual elements requires a social cognitive approach, which argues that our experiences in the social environment influence cognition in the form of cognitive schemas and heuristics which consequently influence decision making and behaviour (Gates, 2000). Therefore, there is a need to examine the key components of decision making that are influenced by both our cognition and our experiences especially as our understanding of disability is shaped by these experiences and the wider context of society (Harpur, 2014; Pettigrew, 1998). These key components, in relation to reasonable adjustments are attitudes, knowledge, and experience.

Attitude. An individual’s attitude is a strong predictor of their behaviour (Ajzen, 2011). Attitudes can be defined as a favourable or unfavourable decision towards something that are formed from a combination of cognitive, affective and behavioural

factors (Haddock & Maio, 2008). According to the social cognitive approach, two main influences of a person's attitude are arguably their knowledge and experience because these are formed in the social world and shape how we think and feel about objects, people or events (Pendry, 2008; Wood & Bandura, 1989). The existing research has suggested that employers have positive attitudes towards working with people with disabilities and are keen to recruit them (Hernandez & Keys, 1994; Ju et al., 2013). However, research has mainly explored an employer's willingness to hire an employee with disabilities rather than addressing the decision-making associated with the willingness or measuring the actual hiring of workers with disabilities (Hernandez & Keys, 1994). There has been some evidence that indicates negative attitudes towards employees with disabilities are related to the organisational culture (Schur et al., 2009).

Knowledge. A prominent factor considered in the literature on reasonable adjustments and decision-making is the significance of knowledge (Hazer & Bedell, 2000; Imran et al., 2011; Jackson et al., 2000). The more knowledge the employer has on the reasonable adjustment legality and the disability itself the better equipped they are to make a well-informed decision (Unger & Kregel, 2003). Cognitive schemas are reliant on information availability and memory: the more knowledge the individual has, the more information available in their memory to make an informed decision (Lunenburg, 2011).

Experience. Experience is extensively discussed in the literature on stereotyping because repeated exposure to a stimulus (or social group) is argued to reduce stereotypes through an implicit attitude effect (Greenwald & Banaji, 1995). Hence, similar results have been found in relation to disability, with individuals who have more experience in working with people with disabilities being more likely to have a positive overall attitude towards them (Hernandez & Keys, 1994; Telwatte et al., 2017). There is however some evidence that indicated experience was not related to the decision-making process so experience is a component that needs further examination (Florey & Harrison, 2000).

Employee Characteristics

Employee characteristics or more accurately, the disability and reasonable adjustment characteristics, are aspects of the disability such as the type of disability and aspects of the reasonable adjustments like the perceived cost that have been found to influence decision-making (Telwatte et al., 2017).

Disability Type. The visibility of a disability, whether it is physical or hidden, is argued to influence the decision-making process (Stone & Colella, 1996). The impact of visibility on reasonable adjustments indicates that psychiatric conditions are viewed

as less legitimate and worthy of reasonable adjustments because of the lack of public knowledge influencing employers' decision-making (Klimoski & Palmer, 1993; MacDonald-Wilson et al., 2002). A further review confirmed prior findings that those with psychiatric conditions were viewed less favourably by employers compared to those with physical disabilities despite no difference in workplace retention and performance after the support was implemented (Keys & Balcazar, 2000). The onset of the disability also plays a role in how it is legitimised by employers with a later or sudden onset being perceived as less legitimate (Florey & Harrison, 2000). Furthermore, the perceived cause of the disability has been argued to explain negative attitudes where if the person with a disability is seen as personally responsible for their disability, for example, alcoholism, then any adjustments are viewed as less reasonable by the employer (Stone & Colella, 1996; Styers & Shultz, 2009). When comparing type of disability, neurodevelopmental conditions such as ADHD have not been considered to date. Therefore, any predictors of granting for ADHD associated adjustments are unknown. Based on the previous findings and the stigma associated with the origin and legitimacy of the ADHD diagnosis, it is predicted that ADHD will be viewed similarly if not less legitimate than mental health conditions (Masuch et al., 2019; O'Driscoll et al., 2012; Patton, 2009).

Perceived Cost. Another characteristic of the reasonable adjustment that has been demonstrated to influence granting is its perceived cost. Many studies have emphasised that most reasonable adjustments are inexpensive and require only small changes (Schartz et al., 2006; Wang et al., 2011). Despite this knowledge, employers judge costs to employers' and employees' time as a key indicator in assessing the reasonableness of an adjustment (MacDonald-Wilson et al., 2002). Telwatte et al. (2017) manipulated cost in an experimental design and found that adjustments that were perceived to cost more were rated as less reasonable and employers were less likely to grant them.

A contextual factor that is yet to be considered is the organisation itself. There are many aspects of the organisation that influence general decision making including the resources, the culture, and stakeholder engagement to name a few. Organisational aspects have been the least researched when addressing reasonable adjustments.

Organisation. Organisational resources have been found to influence the decision-making. For example, resources such as cost depend on the type of the organisation because in one study the more money the organisation had, the more money they were likely to spend on the reasonable adjustment (Lee, 1996). Conversely, evidence suggests that smaller organisations are more likely to retain employees with a psychiatric condition and provide adjustments (MacDonald-Wilson et

al., 2002). Differences in organisation size may be related to the type of industry that employees with disabilities enter and remain in. For example, service and retail industries were the most popular employers and in both industries job roles are repetitive and employees are often given little to no responsibilities. Therefore, reasonable adjustments are more likely to be provided in lower paid roles where there is higher retention thus the granting depends on the job role rather than organisation size. An issue with lower skilled job roles and high retention is that there is limited progression which could explain the underemployment in individuals with disabilities and explain why there are minimal employees with disabilities in high-skilled jobs (MacDonald-Wilson et al., 2002). Hence, more research into reasonable adjustments is needed to unpack these differences to better understand how and why granting decisions are made.

As previously highlighted, organisational politics and power may also influence the decision-making process through the perceived control that an employer has over making a decision, indicating the importance of context that the majority of the research neglects to acknowledge (Foster, 2007; Gates, 2000). What remains clear from the research is that line managers and HR professionals are central to the application and usefulness of reasonable adjustments and the likelihood of granting (Wang et al., 2011). Their knowledge and experience can inform their general attitudes, the type of disability, perceived cost and organisational influences including resources, company type and perceived control all interact to influence their decision-making.

Perceived Control

When the TPB was first applied to the decision-making process for adjustments, perceived control was added in the form of the employers perceived obligation although it was not demonstrated to be a predictor (Florey & Harrison, 2000). Prior conceptualisations have always included an element of control the decision-maker has over the decision especially in relation to adjustments (Stone & Colella, 1996). It is argued that perceived control interacts with the employer's perception of how well resourced the organisation is or how the organisational structure is designed (Araten-Bergman, 2016). One study's findings indicated that even when knowledge of adjustments is high, the perceived authority of the decision was an influential factor in the decision-making process (Unger & Kregel, 2003). Control was not examined in the most recent model of decision-making but based on the evidence base for the TPB and the inclusion of control in all other conceptual models, perceived control was included in the present study.

Study Aims

The study builds on existing models to examine the granting of adjustments rooted in theories of planned behaviour to examine attitudes, intentions and behaviours, including ADHD as a type of disability; supplementing the quantitative measures with qualitative open questions to further investigate gatekeepers' intentions. By gaining this understanding, the study contributes to aim three of the thesis to develop and evaluate an adjustment.

Hypotheses and Research Question

There are three main hypotheses that examine the quantitative relationships between the variables and there is one research question aimed at investigating the qualitative data. The hypotheses and research question are as follows:

H1: A more positive attitude, more knowledge and experience, and higher ratings empathy, legitimacy, necessity, and lower ratings of cost predict ratings of reasonableness.

H2: Reasonableness predicts likelihood to grant reasonable adjustments, over and above empathy, legitimacy, necessity, and cost.

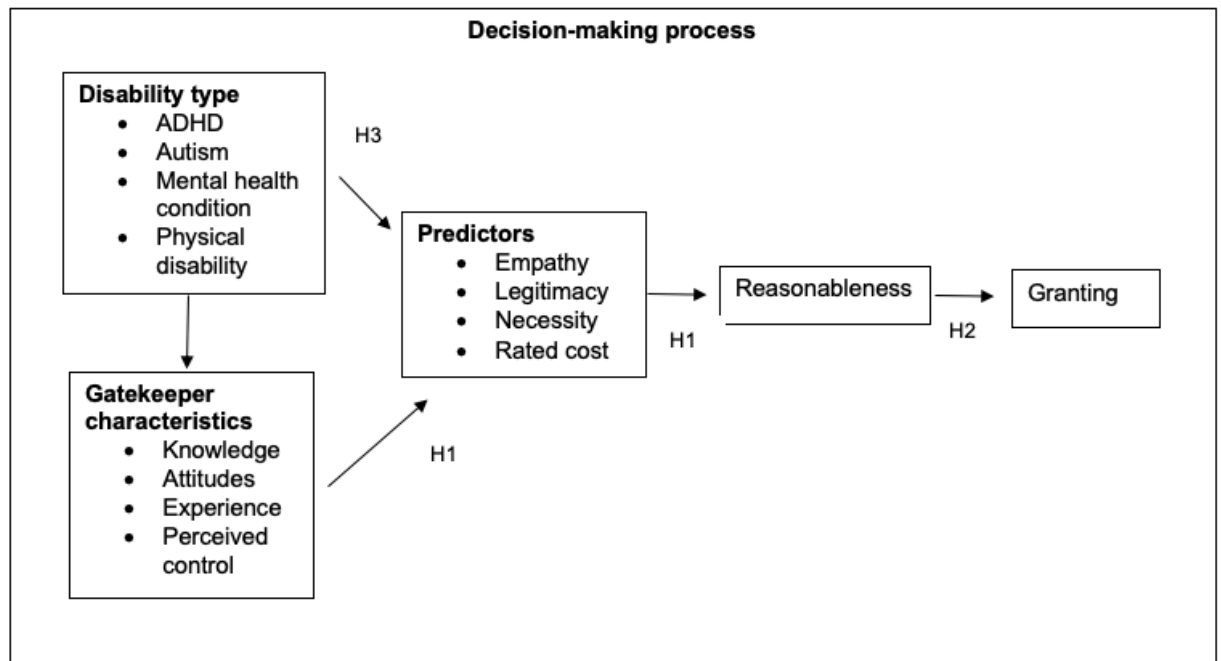
H3: Predictors of the likelihood to grant reasonable adjustments differ according to type of disability.

Research question: How do participants qualitatively justify their decisions to grant or not grant reasonable adjustments?

Figure 7.2 visually depicts the decision-making process examined in the present study.

Figure 7.2

Decision-making process with subsequent hypotheses



Method

Study Design

The study described in Chapters Seven and Eight had an experimental design with data collected at two timepoints, namely Time 1 and Time 2. The data described in this chapter refers to the baseline data at Time 1, prior to experimental manipulation, examining within group relationships. At Time 2, after participants were randomised into control and experimental groups, where the experimental group had completed the e-learning programme, the design included within and between groups measures. Both timepoints used vignettes as stimuli to simulate the types of disability and adjustment requests. In this chapter, the independent variable was the type of disability and the dependent variables were the ratings of empathy, legitimacy, perceived cost, necessity, reasonableness and likelihood to grant the adjustment associated with the different vignettes.

Participants

Participants were 116 line managers or HR professionals, working full or part time, working in the UK, and had been in their role for 18+ months. Positing a medium effect size, Green's formula (1991) suggested that 112 number of participants were needed for appropriate statistical power. The final sample consisted of 112 participants once missing data were removed. A total of 68% of the sample identified as female.

Age ranged from 22-64 years old ($M = 40.5$, $SD = 10.58$), and 56% were line managers with the remaining 44% being HR professionals. Experience of working with employees with disabilities varied greatly from 16 participants having *none at all* to 7 having a *great deal*. Table 7.1 contains detail regarding the characteristics of the sample.

Table 7.1

Characteristics of sample

Characteristic		<i>n</i>
Gender	Male	32
	Female	77
	Prefer not to say	3
Employment status	Full-time	94
	Part-time	19
Self-employed?	Yes	5
	No	108
Size of organisation	Micro	8
	Small	13
	Medium	28
	Large	64
Current role	Line manager	50
	HR professional	63
Length of time in current role	18 months	36
	19 months- 5 years	36
	6-10 years	17
	11-19 years	13
	20+ years	10

Disability	Yes	18
	No	85
	Unsure	9
	Prefer not to say	1

Measures

Attitude

Attitudes towards employees with disabilities were measured using a scale with three aspects of an employer's attitude: productivity perceptions, helpfulness and discomfort. This scale was used in Telwatte et al's (2017) study and includes items from research addressing perceptions and helpfulness (Scherbaum et al., 2005). Participants rated the extent to which they agreed with each item on a 5-point Likert scale. An example item is "employees with disabilities need constant help to perform common work tasks". Using Cronbach's measure of internal consistency, the overall attitude scale had high reliability $\alpha = .82$ (Cronbach, 1951). Any negatively worded items were reverse-coded.

Experience

Experience was measured using one item that required the participant to rate on a 5-point Likert scale how much experience they have had working with an adult with a disability. The response options ranged from *a great deal* to *none at all* and were converted to numerical values for the analysis. The standard deviation for experience was large ($M = 2.56$, $SD = 1.06$) indicating that there was a wide variation in responses. Fourteen percent of participants had no experience, 69% had little to moderate experience, and 17% had a lot to a great deal of experience.

Reasonable Adjustment Knowledge

Telwatte's 2017 study used an adapted 14 item questionnaire which was based on Australian Law. I originally intended to adapt the items to be in line with the UK Equality Act, but the pilot participants found the items were unclear and irrelevant. Therefore, a new measure of reasonable adjustment knowledge was developed and validated specifically for the purpose of this study. The reliability from the validation sample was high $KR_{20} = .72$. In the present sample reliability was $KR_{20} = .53$.

Development of the Reasonable Adjustment Knowledge Scale.

Development of the reasonable adjustment knowledge scale followed recommended psychometric development guidance (Kyriazos & Stalikas, 2018).

Item Generation. Items were generated based on a detailed examination of the reasonable adjustment law and UK online advice and guidance on the law. Items were designed similar to the existing reasonable accommodation scale in that they were statements that require a true or false answer. Best practice guidelines suggest that double the number of desired items are developed and then the required number of items are selected based on reliability and consequent validity (Boateng et al., 2018). Feedback from the study piloting suggested having less than the 14 items in the original adjustment measure so 20-items were generated to later be reduced to 10.

Validation Sample. Prior to validation, the 20 items generated were reviewed by three experts who provided feedback on their clarity, accuracy, and suggested any changes. The three experts were all psychologists familiar with psychometrics with one having experience of designing their own psychometric measure. Their feedback was generally positive, and they unanimously agreed that responses should be recorded dichotomously rather than in a rating scale format. Negative feedback was that the items may be too straightforward.

For the validation sample, a total of 103 participants were recruited through the online crowdsourcing platform Prolific Academic which allows for participants to be financially remunerated for their participation. The sample included 30 males and 72 females. Thirty-nine percent had no knowledge of reasonable adjustments and only 2% indicated they were extremely knowledgeable. Over 50% of the sample had no experience of working with employees with disabilities and only 3% were extremely experienced. Their ages ranged from 21 to 64 years ($M = 38.5$, $SD = 1.42$). A total of 20 participants identified as having a disability which was not specified. Preliminary analyses determined whether there were any significant differences between total correct responses and demographic groups. Self-reported knowledge and experience of reasonable adjustments were positively correlated with total scores, $r(101) = .46$, $p < .001$ and $r(101) = .36$, $p < .001$ respectively, but there were no differences in demographic information like age and gender.

Analysis. A Rasch model, most suited to categorical data, was applied using the statistical programme *R* to analyse the data and hence reduce the number of items from 20 to 10 (Kreiner, 2013). The item characteristic curves were examined for difficulty and indicated that the majority of items were easy to average difficulty. The

most difficult and easy items were removed leaving a total of 14 items. To remove four more items, the point-biserial correlation with the total score was considered alongside the difficulty and reliability coefficients. When the correlation was less than .7 meant that the item was removed (Brown, 2001). For the final 10 items there was a good fit to the model $\chi^2 = 1080.28$, $df = 50$, $p = .42$ and the percentage explained in the latent construct was 97.32%.

ADHD Knowledge

Knowledge of ADHD was measured using an adapted version of the ADHD knowledge scale developed by Bramham et al., (2009). This scale consists of 20 items where the participant is required to indicate whether the statements about ADHD are *true*, *false* or *don't know*. An example item is "ADHD is contagious", with the correct answer *false*. Reliability of this scale was not assessed in the prior research but was considered high in the present study $KR_{20} = .75$ (Kuder & Richardson, 1937). To fulfil the need for distractor items, I used existing literature and the existing ADHD knowledge scale to develop ten statements to test knowledge about autism. Existing scales of knowledge about autism are aimed at parents or health professional's treatment recommendations so were not directly applicable (Imran et al., 2011; Kuhn & Carter, 2006). The remaining ten items assessing knowledge about disabilities was divided in half. Five questions addressed knowledge about depression and the other five asked about knowledge of physical disabilities. These ten items were created in a similar way using the existing knowledge-based scales as a framework (Hess et al., 2004; Werner et al., 2012).

Perceived Control

Perceived behavioural control was measured using a three-item scale that was developed using Ajzen's theory of planned behaviour questionnaire development guidelines (Araten-Bergman, 2016) and was shown to have poor reliability ($\alpha = .38$). The reliability was poor for all the items and they did not correlate highly with each other. As a result, perceived control was removed from the final analysis.

Vignettes

Vignettes are argued to be advantageous because of their closeness to reality and the manipulation of the social context or situation. They are defined as "stimuli, including text and images, which research participants are invited to respond" (Hughes & Huby, 2004 p.36). In the present study, vignettes were presented as short texts outlining a request for a reasonable adjustment. Although each reasonable adjustment procedure differs in the UK, a similarity is that reasonable adjustments are requested formally either by completing a form or writing a letter (Citizens Advice, 2019).

Therefore, using vignettes is a more realistic measure of actual reasonable adjustment requests arguably enhancing the vignettes effectiveness through increasing meaning and relevance for the employer (Hughes & Huby, 2004; Patton, 2009). Rating on a 5-point scale from *extremely likely* to *extremely unlikely* to grant the adjustment formed the dependent variable and was assessed by asking participants to rate each vignette on the following factors: empathy, legitimacy, necessity, reasonableness and rated cost. Each factor was measured using one item where the response was on a 5-point Likert scale similar to the ones in Telwatte's (2017) study. There was the addition of an open-ended response that asked participants to list the reasons for their likelihood of granting the reasonable adjustment based on recommendations from research with vignettes (Hughes & Huby, 2004).

Vignette Development. Each participant was asked to rate four vignettes that described adjustment requests based on four conditions: spinal cord injury, autism, ADHD, and depression. I developed the vignettes based on research in the thesis thus far and they were then reviewed and edited by the research team including occupational psychologists and academics who research disability and the workplace. The vignettes all followed a structure similar to the vignettes in Telwatte et al's (2017) study. A total of 12 vignettes were developed and tested in a pilot study. Inter-rater reliability was used to test the reliability of the vignettes and this indicated good reliability $k = .91$. Three raters used the DSM-V classifications and corresponding workplace research to rate whether the symptoms in the vignette matched the symptoms in the diagnosis or literature, similar to the method used in vignette research (Jepsen et al., 2007). These ratings were used to select the strongest eight vignettes, four to be used at Time 1 and the other four at Time 2.

There were some important considerations based on the limitations of vignette use that were contemplated during vignette development. In relation to attitude and behaviour measurement, vignettes have been criticised for their risk of socially desirable responses, their repetitiveness and their lack of ecological validity (Hebert, Meslin, Byrne, Ross Reid, & Dunn, 1990; Schoenberg & Ravdal, 2000). Research recommends providing no time limit to complete the task, using a combination of closed and open ended questions, and using a 'person-centred interview technique' (Hughes & Huby, 2004; Schoenberg & Ravdal, 2000). The 'person-centred interview' technique is described as a strategy used to support participants in feeling comfortable about giving their advice, for example using phrases like "your opinions are really important to us" (Schoenberg & Ravdal, 2000). These recommendations were adopted in the study. In addition, gender neutral names were used for the employees

requesting the adjustments to avoid gender being a confounding variable in the decision-making process (Martin & Polivka, 1995).

An example vignette is presented below, the remaining can be located in Appendix 5.5:

You are working with Tobie, a social media assistant, whose responsibility is to manage the company's social media channels and assist with larger projects where social media management is required. They have recently been diagnosed with attention deficit hyperactivity disorder and experience difficulties concentrating, challenges with meeting deadlines and feelings of restlessness. They have requested frequent meetings with their line manager to keep to deadlines, regular breaks and a workspace that minimalizes distractions.

Procedure

Participants were recruited through volunteer sampling over the course of six months. Prior to enrolling on the programme, participants were asked to complete a 20- to 30-minute survey which forms the data for the present study. Once completed, they provided their email address to access the e-learning programme. The study received ethical approval from the Birkbeck Research Committee. The study was advertised as a free e-learning programme about neurodiversity and reasonable adjustments. A link to the first survey was shared on all social media platforms, advertised on LinkedIn and Facebook groups whose members were managers or HR professionals, and emailed to Birkbeck College alumni. The survey was administered via the online survey platform *Qualtrics* and participants were asked to provide consent after reading a detailed information page outlining the study's procedure and their rights to confidentiality, anonymity, and how to withdraw their data.

Opening items asked participants about their attitudes towards workers with disabilities followed by a test of their knowledge about reasonable adjustments. Next, participants were asked to rate four vignettes each providing a scenario of a reasonable adjustment request for an employee with depression, autism, ADHD, and spinal cord injury. They rated how much they empathised with the employee, how much they believed the disability to be legitimate, and how much they perceived the adjustment to be necessary and reasonable. They were also asked to rate the adjustment on cost and finally rate whether they would agree to granting the adjustment if they were the employee's manager. Following the vignettes, participants were then tested on their ADHD knowledge and this included distractor items testing knowledge for physical disabilities, autism and mental health conditions. Distractor items were necessary to reduce the impact of participant bias (Gierl et al., 2017). All

individual items and vignettes were presented in a random order for each participant although the overall order in which the scales were presented remained the same. Demographic information was collected last and participants were given the option of '*prefer not to say*' for protected characteristics including gender, ethnicity, and disability. Other demographic information collected was age, employment status, experience of working with employees with a disability, length in role, size of organisation, occupation title, and whether they had any training related to disability at work.

Analysis Plan

The study adopted a mixed methods approach to analysis aiming to understand the decision-making process in more depth using both quantitative and qualitative methods of data analysis also referred to as triangulation (Cassell et al., 2017; Creswell & Plano Clark, 2007). The quantitative data, collected to address the hypotheses, was analysed using linear regressions in the statistical package SPSS version 23. The qualitative data was analysed using template analysis to answer the research question. Initial analyses examined the demographic information to identify any baseline differences between HR professionals and line managers but found no significant results.

Results

Preliminary Analyses

Preliminary analyses assessed whether the assumptions for multiple regression were met. These included investigating whether there were any outliers and whether there was normality of residuals, homogeneity of variance, linearity, independent errors and no multicollinearity (Berry, 1993). There were no outliers and no influential standardised residuals. Correlational analysis indicated that reasonableness and granting were highly correlated above .80 although looking at the VIF and tolerance variables this was not of concern (Field, 2009). The dependent variables, granting and reasonableness, are negatively skewed meaning that participants were more likely to rate the adjustment as more reasonable were more likely to grant it. However, visual inspection of the residual plots suggests this is also not of concern (Field, 2009). The assumption of homogeneity of variance was met.

A multiple regression was run on hypothesis 1 to examine what predicts reasonableness and then a hierarchical linear regression was run on hypotheses 2 and 3 to examine the predictors of likelihood to grant adjustments as well as whether these differ between types of disability. Correlation analyses of the predictor variables indicate that a more positive attitude towards employees with disabilities and higher

knowledge of both reasonable adjustments and ADHD were associated with higher likelihood to grant reasonable adjustments. More experience was related to more perceived control and higher ratings of reasonableness but not related to any other variables. As expected, a more positive attitude was associated with more experience, higher perceived control, and more reasonable adjustment knowledge but it was not related to ADHD knowledge. The correlation matrix is presented in Table 7.2. It is worth noting that the mean reasonable adjustment knowledge is higher in this sample compared to sample used to validate the measure.

Table 7.2*Attitude, experience, perceived control, knowledge, empathy, legitimacy, necessity, cost, reasonableness, and granting*

	<i>M</i>	<i>SD</i>	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Attitude	5.20	.50										
2. Experience	2.58	1.06	.21*									
3. Perceived control	3.20	.66	.19*	.23*								
4. Reasonable adjustment knowledge	7.42	1.65	.26**	.07	.27**							
5. ADHD knowledge	12.33	3.51	.04	.16	.09	.10						
6. Empathy	4.68	.42	.53**	-.08	.12	.03	.15					
7. Legitimacy	4.64	.50	.44**	.11	.21*	.28**	.16	.46**				
8. Necessity	4.27	.65	.21*	.07	-.09	.02	.13	.48**	.34**			
9. Cost	3.31	.57	.33**	.04	.06	.22*	-.02	.14	.26**	.16		
10. Reasonableness	4.20	.55	.38**	.20*	.04	.15	.15	.44**	.40**	.63**	.43**	
11. Granting	4.27	.54	.37**	.17	.10	.19*	.21*	.47**	.40**	.55**	.43**	.86**

* $p < .05$, ** $p < .01$, *** $p < .001$.

H1: A more positive attitude, more knowledge and experience, and higher ratings empathy, legitimacy, necessity, and lower ratings of cost predict ratings of reasonableness.

The model significantly predicted reasonableness $F(8,98) = 14.93, p < .001, \Delta R^2 = .51$. Higher necessity and low cost were the only significant predictors, indicating partial support for the first hypothesis. Regression coefficients and standard errors can be found in Table 7.3.

Table 7.3

Hierarchical regression results for reasonableness

Variables	<i>B</i>	<i>SE</i>	β	R^2	ΔR^2
Constant	.04	.48		.55	.51***
Attitude	.06	.10	.06		
Experience	.06	.04	.12		
RA Knowledge	.02	.02	.07		
ADHD Knowledge	.01	.01	.04		
Empathy	.14	.12	.11		
Legitimacy	.06	.09	.05		
Necessity	.40	.07	.49***		
Cost	.25	.07	.27***		

B = unstandardized regression coefficient, *SE* = standard error of the coefficient, β = standardized coefficient, R^2 = coefficient of determination, ΔR^2 = adjusted R^2 , * $p < .05$, ** $p < .01$, *** $p < .001$.

H2: Reasonableness predicts likelihood to grant reasonable adjustments, over and above empathy, legitimacy, necessity, and cost.

To address this hypothesis a hierarchical multiple regression was conducted, Step 1 included experience, knowledge, attitude, empathy, legitimacy, necessity and cost. Adding reasonableness in Step 2 explained an additional 26% of the variance in granting and the change in R^2 was statistically significant $F(9,106) = 33.32, p < .001$. Significant predictors of higher granting in Step 1 like legitimacy and necessity were no longer predictors in Step 2 with reasonableness being the only significant predictor accounting for an additional 33% of the variance. Therefore, H2 is fully supported.

Table 7.4*Hierarchical regression results for granting*

Steps and variables	<i>B</i>	<i>SE</i>	β	R^2	ΔR^2
Step 1				.50	.46***
Constant	.04	.50			
Attitude	.02	.10	.01		
Experience	.05	.04	.10		
RA Knowledge	.04	.03	.12		
ADHD Knowledge	.02	.01	.12		
Empathy	.26	.13	.21		
Legitimacy	.05	.09	.05***		
Necessity	.28	.07	.35***		
Cost	.26	.07	.28		
Step 2				.76	.73***
Constant	.02	.35			
Attitude	-.03	.07	-.03		
Experience	.00	.03	.01		
RA Knowledge	.02	.02	.07		
ADHD Knowledge	.01	.01	.09		
Empathy	.16	.09	.13		
Legitimacy	.01	.07	.01		
Necessity	-.01	.06	-.01		
Cost	.07	.06	.07		
Reasonableness	.74	.07	.76***		

B = unstandardized regression coefficient, *SE* = standard error of the coefficient, β = standardized coefficient, R^2 = coefficient of determination, ΔR^2 = adjusted R^2 , * $p < .05$, ** $p < .01$, *** $p < .001$.

H3: Predictors of the likelihood to grant reasonable adjustments differ according to type of disability.

To examine this hypothesis, two separate regression models were assessed. The first investigated whether predictors of reasonableness (empathy, legitimacy, necessity, cost) differed on disability type. Then, these predictors were added at Step 1 and reasonableness at Step 2 to see if predictors of granting differed based on disability type.

Empathy was not a significant predictor of reasonableness for any of the disabilities. Higher ratings of legitimacy only became a significant predictor of higher reasonableness for the mental health condition. Higher necessity significantly predicted higher reasonableness for the hidden disabilities: ADHD, autism, and mental health. Whereas lower cost predicted reasonableness for all disability types: ADHD, autism, mental health, and physical disability.

Predictors of the likelihood to grant the reasonable adjustment differ slightly to those that predict reasonableness. For example, empathy is a significant predictor at Step 1 for the ADHD vignette as well as the physical disability vignette. Empathy then remains a significant predictor of likelihood to grant in the ADHD vignette after reasonableness is added. Lower cost is a significant predictor of granting for all disability types in Step 1 but only remains a significant predictor for physical disability once reasonableness is added at Step 2. Adding reasonableness significantly explains an additional 16% of the variance for ADHD granting $F(1,105) = 67.44, p < .001$, 38% for autism granting $F(1,105) = 162.77, p < .001$, 11% for mental health granting $F(1,105) = 27.17, p < .001$, and 31% for physical disability granting $F(1,104) = 109.09, p < .001$. Therefore, the hypothesis is partially supported with some predictors such as legitimacy and empathy being predictors of reasonableness and granting for some disability types and not others. Table 7.5 displays the hierarchical regression coefficients for reasonableness and Table 7.6 displays the same information for granting.

Table 7.5*Hierarchical regression results for reasonableness across types of disability*

Steps and variables	ADHD			Autism			Mental Health			Physical disability		
	<i>b</i>	<i>SE</i>	β	<i>b</i>	<i>SE</i>	β	<i>b</i>	<i>SE</i>	β	<i>b</i>	<i>SE</i>	β
Step 1												
Constant	-.27	.42		.41	.74		.98	.41		.03	.68	
Empathy	.14	.09	.11	-.01	.17	-.01	.12	.09	.11	.49	.13	.36
Legitimacy	.09	.07	.09	.11	.14	.07	.19	.06	.26**	.07	.12	.05
Necessity	.60	.07	.56***	.53	.07	.57***	.24	.06	.32***	.25	.09	.26
Cost	.27	.05	.31***	.25	.09	.21**	.23	.06	.28***	.20	.08	.20*
R ²	.63***			.41***			.45***			.39***		

B = unstandardized regression coefficient, SE = standard error of the coefficient, β = standardized coefficient, R² = coefficient of determination, Δ R² = adjusted R², **p* < .05, ***p* < .01, ****p* < .001.

Table 7.6*Hierarchical regression results for granting across types of disability*

Steps and variables	ADHD			Autism			Mental Health			Physical disability		
	<i>b</i>	<i>SE</i>	β	<i>b</i>	<i>SE</i>	β	<i>b</i>	<i>SE</i>	β	<i>b</i>	<i>SE</i>	β
Step 1												
Constant	-.35	.46		.49	.84		1.57	.45		.04	.67	
Empathy	.34	.10	.26***	.13	.19	.06	.10	.11	.09	.45	.12	.33***
Legitimacy	.11	.08	.11	-.05	.15	-.03	.14	.06	.19*	.18	.12	.12
Necessity	.39	.08	.36***	.54	.08	.54***	.23	.07	.30***	.11	.09	.12
Cost	.28	.06	.32***	.24	.10	.19*	.21	.07	.25**	.35	.08	.35***
R ²	.55***			.36***			.34***			.37***		
Step 2												
Constant	-.16	.36		.13	.53		1.07	.42		.01	.47	
Empathy	.24	.08	.19**	.14	.12	.07	.04	.09	.03	.10	.09	.07
Legitimacy	.05	.06	.05	-.14	.10	-.09	.05	.06	.06	.12	.08	.09
Necessity	-.02	.08	-.02	.08	.06	.08	.11	.07	.14	-.07	.06	-.07

Cost	.10	.05	.11	.01	.07	.01	.10	.07	.11	.21	.06	.20***
Reasonableness	.68	.08	.69***	.88	.07	.82***	.51	.10	.50***	.71	.07	.72***
ΔR^2	.71***			.74***			.45***				.68***	

B = unstandardized regression coefficient, SE = standard error of the coefficient, β = standardized coefficient, R^2 = coefficient of determination, ΔR^2 = adjusted R^2 , * $p < .05$, ** $p < .01$, *** $p < .001$.

Research Question: How do participants qualitatively justify their decisions to grant or not grant reasonable adjustments?

A template analysis was conducted on the explanations that participants provided for whether or not they had granted the reasonable adjustment (King, 2012). The explanations varied in their length and content from one-word answers to those over 100 words, there were 388 explanations in total, formed from 15,263 words from 98 participants. Once the final template was decided a frequency count of themes, qualitative content analysis, was conducted to gain an understanding of the proportion of explanations in each category (Mayring, 2000).

The process involved the six steps of template analysis, described in Chapter Six (King & Brooks, 2016). Prior to the familiarisation stage, responses were grouped according to the type of disability (i.e. autism, ADHD, depression, and spinal cord injury). A binary code was then allocated to the qualitative comment that represented the quantitative response to how likely they were to grant the adjustment. The likelihood to grant the adjustment coding was split into two groups: likely and unlikely. Participants who responded with '*neither likely nor unlikely*' were coded as unlikely to grant the adjustment because of the uncertainty and evidence suggests partial granting is associated with the same negative outcomes as not granting adjustments (Schur et al., 2014). Template analysis is deemed appropriate because of its flexibility in extracting themes within and between participants (Brooks et al., 2015). After familiarisation with the entire dataset, preliminary coding was conducted on a subset of the data (focused on one disability) and initial themes were developed (Brooks et al., 2015). Themes were then clustered based on whether they were related to the likely or unlikely group and a coding template was formed.

The template was then applied to remaining data and amended accordingly (King & Brooks, 2016). It was at this step that I noticed a minority of explanations were not matching the quantitative data. For example, participants who had selected that they were likely to grant the adjustment were providing conditions on which they would grant it such as, "I would consider it necessary to increase supervision to ensure deadlines are met and that the standard of work is acceptable, given the reputational risk." As a result, they were coded as reasons to be unlikely to grant the adjustment because of the conditions. A total of 40 participants were likely to grant all the adjustments but included conditions (like regular performance reviews), requests for further advice, and questioned the employee's suitability for the role. The final template can be located in Appendix 5.6 and was finalised once it had been applied to the entire dataset (King, 2012).

The qualitative content analysis was conducted after the final version of the template was agreed (Krippendorff, 2004). The method was used to gain an understanding of the frequency of the codes or reasons provided so that the themes could be presented by frequency in the final template. Therefore, I adopted a deductive approach, where themes and their definitions were provided prior to the analysis (Mayring, 2000). The frequency calculated was how often the themes appeared per participant, i.e. person frequency (Schilling, 2006). A percentage in relation to the number of codes appearing in the two groups (reasons for and reasons against granting) was calculated.

The core themes, subthemes and their subsequent definitions, results from the content analysis, and example comments are listed in Table 7.7

Table 7.7*Core and subthemes with their subsequent description and example comments*

Core themes	Sub themes	% of comments	Description	Example comments
Reasons likely to grant	Benefits individual	38	Reasons describing how the adjustment would benefit the individual (ability to do job, wellbeing, satisfaction, work-life balance)	<p><i>"I am certain that reasonable adjustments like these in the case of mental health issues will increase the productivity of the employee comparing to the situation when such adjustments are not granted. It also may have a positive effect on his/her wellbeing which could lead to higher job satisfaction."</i></p> <p><i>"Without making the space safe and accessible the team member is unable to perform their role. They need to have regular breaks to ensure their wellbeing and their mental health too"</i></p>
	Benefits organisation	55	Benefitting the organisation through increase productivity and performance	<i>"The key consideration is that they are able to do the job. Therefore, it is reasonable to support this. By doing so it demonstrates companionship/organisation buy-in to that individual which may enhance their productivity and loyalty."</i>
	Personal experience	8	Personal experience of knowing someone (themselves, family, colleagues) with the condition	<p><i>"I have personally managed an employee with ADHD, after reviewing their requests, which was similar to the above, they managed the work environment much better, being able to provide good output of work, with achieving good results, so I would feel it to be benefit of the company & the employee or put these requests in place"</i></p> <p><i>"I personally identify with this to the extent this is almost exactly the adjustments I have had in the past..."</i></p>
Reasons unlikely to or conditions to grant	Suitability for the role	13	Questioned the employee's suitability for the role and suggested they would find another role instead of accommodating	<p><i>"we might need to think about alternative roles"</i></p> <p><i>"However I hope this was considered at recruitment. If not maybe, consider her for an alternative position"</i></p> <p><i>"I have selected disagree because I believe that he's in the wrong role."</i></p> <p><i>"Social media and anxiety do not match well in my opinion so potentially this may have disastrous consequences for both employee, and employer."</i></p>

Need for professional advice	10	Required advice from a medical professional or occupational health about whether the adjustment is appropriate or whether the condition is legitimate	<p><i>"I would have concerns over an employee working remotely with this condition and would like further advice from a GP on whether this adjustment is the most advisable."</i></p> <p><i>"... I would get Occ Health to review this individual and make recommendations for adjustments in conjunction with the employee"</i></p>
Delegitimising condition	7	Questioning whether the condition is a legitimate disability	<p><i>"Depression is an illness not a disability?"</i></p> <p><i>"I am not sure this is a disability." (ADHD)</i></p>
Negative impact on the team	18	Arguing that granting the adjustment would have a detrimental impact on the team (either increased workload or envious of special treatment)	<p><i>"could pose problems with other colleagues that someone is getting something they are not"</i></p> <p><i>"I would like more information about the request for additional breaks to ensure equity between the staff members and others in the team"</i></p>
Negative impact on the manager	18	Arguing that the adjustment would put undue strain on the manager	<p><i>"ADHD can be difficult to manage"</i></p> <p><i>"Frequent meetings" - more work..."</i></p>
Negative impact on the organisation finances	20	The adjustment is expensive for the organisation to implement and therefore unreasonable	<p><i>"It is expensive to provide someone a unique workspace"</i></p> <p><i>"Having not worked in a work setting with someone with ADHD, I wonder how a workspace could be adapted to minimise distractions - and the cost and logistical challenge of that."</i></p>
Perceived incompetence	52	Scepticism about taking advantage of the special treatment, about whether they would be as productive as another employee, or that they need close managing	<p><i>"The self-paced workload gives me cause for concern, as I fear this may be abused."</i></p> <p><i>"If they are productive and able to meet deadlines with these measures in place then it is reasonable, if the adjustment is unsuccessful it becomes an issue."</i></p>

As per the final template, there were explanations for why the adjustment was likely to be granted and why the adjustment was unlikely to be granted which formed the two higher order themes. There were three sub-themes in the reasons for granting adjustments. The most common theme/reason to grant adjustments were that the adjustment would *benefit the organization* such as, increased performance and productivity. Another reason/theme was that participants were able to explain how the adjustment would *benefit the individual*, the employee requesting the adjustment. For example, one request was for an employee to have flexible working because of insomnia associated with depression and participants explained how the adjustment would improve their symptoms, i.e. being less fatigued by having flexible start times. The third reason/theme was if the participant had *personal experience* of either the condition themselves or knowing either a colleague, friend or relative with the condition which seemed to increase understanding of why the adjustment would be effective.

The core theme labelled *reasons unlikely to or conditions to grant the adjustment* contained the most sub-themes. The most common subtheme elicited, *perceived incompetence*, was formed from explanations that were implicitly sceptical of the employee described in the vignette. An anonymised quote from a participant to illustrate this theme is “may need to consider capability if productivity does not improve”. Some participants were sceptical that the employee might *take advantage* of their adjustment as an excuse to produce less work which was more prevalent in the mental health condition. In contrast, others specifically stated that they would have to *monitor or manage the employee* more closely to check that their levels of productivity did not decrease after the adjustment. The quote above illustrates that assumptions about capability were made even though the vignette did not provide information about current productivity, only details of the employee’s condition.

Subthemes related to the *negative impact* the adjustment would be perceived to have *on the team, the manager, and the organisation finances* were also extracted from over 50% of explanations for being unlikely to grant the adjustment. Participants were concerned that some adjustments like working from home would mean that the employee would not be able to do certain job tasks, and these would therefore fall on their colleagues. They also argued that the team would perceive the adjustment as unfair. The negative impact on the manager related to adjustments where frequent meetings with the line manager was requested. Some participants felt this adjustment would significantly increase the manager’s workload and felt this was less feasible. Arguments that some adjustments are too expensive for organisations were listed, more so for adjustments that would include the redesign of buildings and desk spaces.

Another theme was coded in the autism and ADHD adjustments and was titled *suitability for the role* where participants argued that the symptoms indicated that the employee was not suitable for the role and should change to one that is more appropriate. This judgement seemed to be based on the assumption that the employee would be unable to perform well in the role based on their challenges related to the disability. For example, “*the position he is in is not suitable for the disability he has*” was a comment explaining why the participant would not grant the adjustment for an autistic employee working as a receptionist.

A subtheme elicited from 10% of comments was the reason that the participant would *require more information from medical professionals* prior to accepting the adjustment. For example, one participant wrote “I would refer to occupational health in the first instance and await their recommendations”. For adjustments that were perceived as expensive, participants wanted further advice to ensure that the adjustment was necessary.

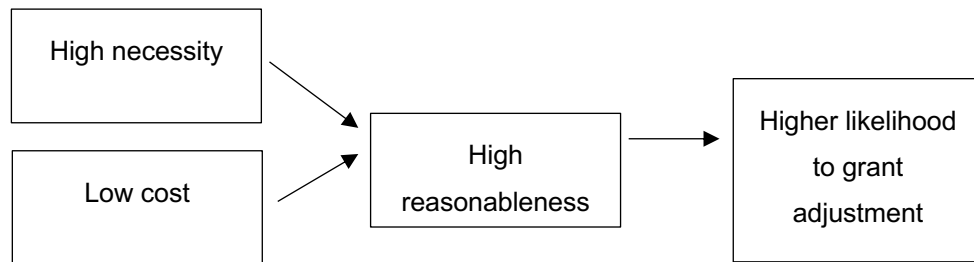
The last theme/reason that was predominant in the mental health responses but also appeared in the ADHD responses was the *questioning the legitimacy* of the condition. For instance, one participant commented “I’m assuming that the ADHD is serious enough to be considered a disability...”. This code can be linked to the quantitative findings where legitimacy is related to reasonableness and granting in the mental health condition but not for others.

Discussion

The aim of the present study was to examine the predictors of the likelihood to grant reasonable adjustments in a sample of UK HR professionals and line managers. Overall, a judgement of reasonableness was the strongest predictor of likelihood to grant the adjustments and perceived necessity and cost predicted reasonableness. See Figure 7.3 for a visual representation. Higher knowledge and more positive attitudes were related to higher likeliness to grant adjustments but did not directly predict reasonableness or granting. As expected, predictors of reasonableness differed according to the type of disability the adjustment was related to. However, the ways in which they differed were unexpected and unlike prior research with empathy being a predictor for ADHD and legitimacy being a predictor for depression. This study is one of the first to examine the qualitative justifications of granting which found reasons not to grant adjustments contained negative stereotypes and ableist views.

Figure 7.3

Significant predictors of likelihood to grant reasonable adjustments



Predictors of Reasonableness and Granting

The first two hypotheses examined the predictors of overall reasonableness and granting of the four adjustments. Knowledge and attitude had a positive relationship with granting and more experience was related to higher reasonableness but not granting. These findings are similar to those from an Australian sample where knowledge, attitude, and experience were related to granting but not predictors (Telwatte et al., 2017). The understanding of what makes an effective adjustment is arguably related to the knowledge of the law and the knowledge of the disability or person who has requested the adjustment. These findings suggest that judgements are not based solely on knowledge and instead, knowledge, attitudes, and experience work as mediators of these judgements. For instance, knowledge and experience interact together rather than separately through intergroup contact theory (Popovich et al., 2003). It may also depend on the type of knowledge associated with the disability rather than generic knowledge about the adjustment law (Styers & Shultz, 2009).

Perceived reasonableness of the adjustment accounted for 76% of the variance in likelihood to grant the adjustment. Reasonableness being the strongest predictor of granting over and above other variables is consistent with prior research (Telwatte et al., 2017). The legal meaning of reasonableness has different interpretations at both country and individual levels (Roulstone & Prideaux, 2009). The variation in meaning is because the definitions are constructed by society and with the dominance of the medical model understanding of disability in current society, reasonableness is misconstrued as a negotiation of how much the individual can adapt to the environment (Roulstone & Prideaux, 2009). Furthermore, at the individual level, reasonableness is a subjective assumption based on information available to the person (Scroggins, 2007).

Consistent with prior research, both perceived cost and necessity were significant predictors of reasonableness (De Asís Roig, 2016; Telwatte et al., 2017;

Wang et al., 2011). The perceived necessity of the adjustment is subjective and depends on a range of factors. To understand if an adjustment is necessary a person must understand how the disability impacts the employee or candidate and comprehend how the adjustment reduces or removes the impact of these barriers (De Asís Roig, 2016). Necessity was the strongest predictor of reasonableness in this study which means participants were able to see how the adjustment would benefit the individual (Telwatte et al., 2017).

Cost is associated with legal justifications of reasonableness and often depend on the size and resources of the organisation. Interestingly, perceived cost remains a predictor although there was no information in the vignettes about the organisation's size or resources. Findings in prior research demonstrate that adjustments are commonly misconceived to be expensive when in reality, evidence suggests the majority of adjustments are inexpensive and easy to implement (Jackson et al., 2000; Schartz et al., 2006). Evidence further suggests that employers are unaware of the financial support available for adjustments which could also be an explanation of why the cost was a factor in the judgements of reasonableness (Unger & Kregel, 2003). An alternate explanation is that cost of an employer's time was deemed the most expensive and this is in line with the comments specifically related to the adjustment involving frequent meetings with the line manager (MacDonald-Wilson et al., 2002).

Contrary to prior research, empathy and legitimacy were not predictors of overall reasonableness and likelihood to grant reasonable adjustments. Interpretation as to why this is the case is examined later when assessing the differences in predictors depending on type of disability (Telwatte et al., 2017).

Predictors of Reasonableness and Granting According to Type of Disability

H3 investigated whether the predictors of reasonableness and granting differed according to the type of disability. Prior research has focused on the differences between psychological and physical disabilities arguing that because psychological disabilities tend to be hidden, they are less likely to be granted (Balsler, 2007; Telwatte et al., 2017). The present study distinguished between hidden disabilities to examine whether ratings for ADHD differed compared to a mental health condition (depression) and another neurodevelopmental condition (autism). The main differences between the predictors were that empathy predicted reasonableness for both the physical disability as well as ADHD but not depression or autism. Reasons for this could be that challenges associated with ADHD such as, time management and difficulty concentrating, are relatable and hence easier to empathise with because they are common shared experiences (Eklund et al., 2009). Higher empathy has been

associated with higher intentions to support those with other disabilities in a different sample of HR professionals and this was argued to be because of the moral responsibility to support others as part of their job role (Mencel & May, 2009).

Legitimacy was also a predictor of reasonableness for the depression adjustment but not for others. The qualitative comments provide more detail whereby participants explained they did not believe depression to be a disability due to it not lasting more than 6 months and being treatable so were therefore unlikely to grant the adjustment. These findings suggest that adjustments are understood as non-changeable and permanent or that adjustments are less necessary because of the impermanence of the condition. Thus, demonstrating a lack of knowledge about depression and adjustments. Even though general awareness about mental health in the workplace is improving these explanations highlight negative stigma still exists and remains to be practically addressed (Little et al., 2011).

Qualitative Reasons to Grant and Not to Grant

The reasons participants stated when asked to explain why they granted or did not grant the adjustment varied. Participants more likely to grant the reasonable adjustment commented on benefits to the individual and to the organisation once the adjustment was granted. The perceived benefits are in line with research on actual adjustments where both employees and employers reported benefits associated with increased retention, productivity, attendance, and morale (Schur et al., 2014). These findings demonstrate that participants better able to understand why the adjustment was needed were more likely to grant highlighting the important of awareness of adjustments and disabilities and how knowledge positively impacts the decision-making process.

Participants who were unlikely to grant the adjustments gave a range of reasons. Some acknowledged a lack of knowledge and wanted advice from various medical professionals. Although an evidence-based decision is arguably good management when unclear on a topic, there is a lack of regard for the individual who knows their disability best and has requested the adjustment. Thus, these participants did not adopt a personalised approach (Schultz et al., 2011).

Other reasons for being unlikely to grant were not based on evidence and instead related to stereotypical beliefs such as unsuitability for the role or assumptions that colleagues would feel like it was favouritism. Prior research also found that being unlikely to grant was not based on evidence (Lengnick-Hall et al., 2008). These stereotypes can be explained through the stereotype content model (SCM) as manifestations of ableism (Fiske et al., 2002). SCM was originally developed based on

gender research and argues that as it became less socially desirable to be outwardly sexist, more ambivalent forms of sexism arose (Glick & Fiske, 1996). These forms of ambivalent sexism were then grouped into hostile and benevolence based on two interacting dimensions of warmth and competence. Concepts from the SCM have since been applied to ableism where hostile ableism is related to lower ratings of warmth, but higher ratings of competence and benevolent forms of ableism are judgements of low competence but high warmth (Bogart & Dunn, 2019). The themes identified in the qualitative analysis can be explained by the feelings experienced and outlined in a study on experiences of ableism (Nario-Redmond et al., 2019). The SCM and related themes from the present study are shown in Table 7.8.

Table 7.8

Stereotype content model table adapted to include present study findings

	Low competence	High competence
Low warmth	Feel: disgust, contempt Theme: Incompetence Type: hidden	Feel: envy, resentment Theme: Delegitimising and negative impact on team, organisation finances and manager Type: physical and hidden
High warmth	Feel: pity, sympathy Theme: suitability for the role Type: neurodevelopmental	Feel: pride, admiration Theme: no theme Type: occurred in one comment related to physical disability adjustment

Note. Feel = feeling, Theme = theme from analysis, Type = the type of disability the theme was associated with. Adapted from "Hostile, Benevolent, and Ambivalent Ableism: Contemporary Manifestations," by M.R. Nario-Redmond, A.A. Kemerling, and A. Silverman, 2019, *Journal of Social Issues*, 75(3), p.7 (<https://doi.org/10.1111/josi.12337>).

For example, feelings of pity are linked to both low competence and high warmth defined as conflicting assumptions about tenderness and distress (Fiske et al., 2002). Experiences of pity have been linked to paternalistic behaviour where the person with a disability is assumed to need help or protection (Nario-Redmond et al., 2019). These assumptions could explain why managers felt that the employee with a disability was unsuitable for the role and needed help finding something deemed to be a better fit to their impairments. Thus, managers were unlikely to grant the adjustment, disregarding what the employee may be able to do and relying on the stereotype to make a decision (Colella et al., 1998). As Table 7.8 shows, these assumptions were

only found in explanations related to autism and ADHD. Explanations as to why there are differences are likely to be related to the sample being already interested in neurodiversity so having more feelings of warmth towards this group.

The most frequent reason for being unlikely to grant the adjustment was perceived incompetence, which can be explained by the employer's feelings of low warmth and judgements of low competence toward the employee (Fiske et al., 2002). In these explanations, judgements were often made that the employee requesting the disability would have poorer productivity and would need their line manager to closely manage them. These assumptions are in line with existing adjustment research where increase levels of supervision are experienced by employees with disabilities compared to employees without disabilities (Schur et al., 2009). In addition, employees with disabilities report having to challenge the discourse of lower productivity associated with them when beginning in new organisations (Jammaers et al., 2016; Waisman-Nitzan et al., 2019).

Another example is that participants questioned the legitimacy of depression and ADHD. Prior studies have also demonstrated that hostile ableism is associated with mental health conditions and explanations suggest this is linked to the invisibility of the condition (Keys & Balcazar, 2000; Mitchell & Kovera, 2006). For ADHD, it could be argued that the recency of the condition being understood to continue to adulthood has influenced the assumptions of legitimacy. Feelings of envy can describe the themes where participants complained about the negative impact the adjustment would have on the organisation's finances, the team members, and themselves as the manager. Nario-Redmond et al., 2019 found experiences of envy were linked to workplace adjustments where individuals with disabilities found it hard to justify their needs because adjustments were perceived as special privileges rather than legal rights. Feelings of envy were related to both the physical and hidden disabilities in the present study indicating that these assumptions do not differ according to disability type and may be the most harmful. Research investigating the behavioural tendencies associated with feelings of envy finds they are associated with passive harm including social exclusion (Cuddy et al., 2007).

Limitations and Future Research

The first limitation is that the sample was a volunteer sample which reproduced a common bias in research where the sample were mostly female and worked in the education, training, or psychology sectors who generally have more positive attitudes towards disabilities and greater willingness to participate in research (Vornholt et al., 2013). Consequently, it is difficult to generalise the findings from this sample to

managers/HR professionals as a whole and especially to those with poorer knowledge, negative attitudes and stereotypical reasoning working in organisations and less willing or able to take part in research. Social desirability also plays a role in any research on minority groups because it is unfavourable to discriminate and the measures of attitude in the present study were not implicit (Loo, 2001).

Attempting to reduce complex decision making into one theoretical model has limitations because of the vast differences in both the disability characteristics and the employer characteristics. Therefore, a second limitation is that part of the study is reductionist with generic models being weaker and instead the focus should shift to examining the type of adjustments (Balsler, 2007).

A third limitation is that the results can only be interpreted in the context of the specific adjustments outlined in the four vignettes. For example, Telwatte's 2017 study manipulated cost and severity of the condition to examine the differences in adjustments across the types of disability. In the present study, as participants were signing up for an e-learning programme, discussed in the next chapter, efforts need to be made so that there was less chance of participant fatigue whilst being able to collect enough data to have adequate power. As a result, there may be further differences depending on the severity of the disability and the cost of the adjustment and the predictors might not be generalisable to other disabilities. More research examining the nuances between assumptions and predictors of granting related to ADHD and other hidden disabilities is warranted. It would be interesting to further explore why there was higher empathy for ADHD in the present study.

A final limitation is that due to the research being correlational causality cannot be inferred and the predictors cannot explain all the variance in granting. Future research could investigate alternative predictors, and these could be formed from the qualitative findings in this study related to ableism. A predictor to further investigate is the status of the roles in which the adjustment is requested for due to emerging evidence that lower status job adjustment requests were seen as more reasonable (Styers & Shultz, 2009). Adopting the stereotype content model may offer an explanation as to why job status might play a role in decision making because lower ratings of competence but high warmth are associated with lower social status (Nario-Redmond et al., 2019).

Finally, the aim of existing research is to map the predictors of granting adjustments using a cross sectional design. Therefore, there is a gap in research that adopts a practical approach, aiming to increase knowledge and change attitudes and

behaviour based on these conceptualisations. These are the aims of the final study outlined in the next chapter and should be considered for future research.

Implications for Theory, Research, and Practice

The present study builds on existing theory on decision-making of reasonable adjustments by examining the predictors in a UK sample and including adjustment based on neurodevelopmental conditions. It replicates prior findings that indicate reasonableness is the most influential predictor of likelihood to grant reasonable adjustments and supports previous models (Lee, 1996; Telwatte et al., 2017). It additionally provides evidence for the stereotype content model and extends this by suggesting there are distinct biases in relation to the workplace (Nario-Redmond et al., 2019). Overall, there is an overarching link to social cognitive theories with elements of social cognition, including TPB, being influential in both decision making and understanding stigma emphasising the importance of applying social cognitive theory to workplace contexts (McCormick et al., 2015).

The implications for research are twofold. The first is that the present study provides a baseline for other research to build on and examine whether these predictors change or whether interventions can influence behaviour. Secondly, it demonstrates a need for more research to address stigma associated with disabilities with a focus on neurodevelopmental conditions as well as mental health conditions.

An implication for practice includes the need to increase knowledge of reasonable adjustments in managers and HR professionals because this influences judgements of necessity and cost which in turn predict reasonableness and consequently granting. There is also a need to reduce stigmatising views of hidden disabilities as part of diversity and inclusion initiatives that often focus on other minority groups.

Conclusions

The purpose of this chapter was to examine the decision-making process for granting of ADHD related adjustments in a sample of HR professionals and line managers who are key gatekeepers in the process. Findings highlight the complexity and subjectivity of the decision-making process. For example, the predictors of adjustment granting depend on the type of disability and assumptions of how reasonable the requests were. Theories from social psychology assisted in explaining these differences with decisions to not grant the adjustment being related to stereotypes and lack of awareness. Furthermore, assumptions of reasonableness were related to perceived cost and necessity of the adjustments. Therefore, the next chapter applies these findings to an adjustment which aims to increase knowledge of ADHD

and adjustments so that the decision-making process is based on knowledge rather than incorrect assumptions.

Chapter 8 Does an e-learning programme increase employer knowledge of ADHD and reasonable adjustments and improve decision-making?

Chapter Eight applies the findings from the evidence-base generated throughout the thesis to investigate whether an e-learning programme is an effective reasonable adjustment for adults with ADHD. Therefore, this chapter contributes to the third aim of the thesis to develop and evaluate an adjustment. The approach was to target the adjustment at key gatekeepers in the adjustment process i.e. the managers and HR professionals who decide whether the adjustments are granted. By shifting the focus of the support to the environment and not the individual, adopting the theory of psychoeducation, the research contributes to the literature arguing for a holistic approach and is in line with the legal requirements and social model understanding of disability.

Background

Both the social model of disability and psychoeducation argue that to best support people with disabilities, adjustments should be made to the external environment, including members in the person's social network as well as to the individual's immediate environment (Hirvikoski et al., 2017; Lukens & Mcfarlane, 2004; Schur et al., 2014). The findings from the Time 1 data, Chapter Seven, indicate that managers' cognitions impact whether or not they grant adjustments including perceptions of what makes an adjustment reasonable. These judgements have practical consequences and can impact whether or not employees with disabilities are able to access reasonable adjustments (Schur et al., 2014). Stereotypical judgements due to lack of knowledge were also identified indicating a need for a holistic approach to improve managers' attitudes, knowledge, and behaviour regarding reasonable adjustments. The theory of planned behaviour assisted in explaining the decision-making process and it has also been applied in health research to change behaviour by targeting the key predictors like attitude and knowledge (Ajzen, 2011). Literature suggests an intervention is required to increase the manager's knowledge and increase positive attitudes (Foster, 2007; Patton, 2009). Challenging negative attitudes with new information has also been theorised using to be effective according to the TPB (Ajzen & Fishbein, 1975).

A method which aims to reduce bias, namely reducing stereotypical judgements and increasing knowledge about diverse groups, that has been applied to the workplace is diversity training (Paluck & Green, 2009; Phillips et al., 2016). The most popular form of training is unconscious bias training which aims to identify and educate

employees about implicit biases (Atewologun et al., 2018). However, there are conflicting findings when examining the effectiveness of unconscious bias training with most studies demonstrating an increase in awareness but not a change in behaviour (Noon, 2018).

Disability Training in Organisations

Documented workplace interventions, including training, that aim to increase knowledge about disability are scarce. Published studies of interventions that have been assessed for efficacy provide little information regarding their methodology and intervention design making it difficult to understand how the training programme was developed, implemented and evaluated. A broader review of diversity training emphasises that future research needs a theory-driven approach to designing interventions and these need to be field-based rather than lab-based (Paluck & Green, 2009).

A search of the literature on disability specific training programmes for organisations identified five studies of relevance (Bailey et al., 2001; Forrest, 2007; Reynolds, 2010; Rochette et al., 2017; Rudstam et al., 2013). Key aspects were identified and are summarised in Table 8.1.

Table 8.1*Table of existing studies with their respective author, type of training, method, theory, and outcomes*

Author	Training	Duration	Design	Sample (n)	Theory	Outcomes
Bailey et al., 2001	Live: role plays	Unclear	Quasi-experimental	Police officers (57)	None mentioned	Attitudes towards eugenics
Forrest., 2007	Online: independent learning with live forums	5 weeks (1 hour per week)	Single group experiment	Library staff (14)	None mentioned	Knowledge, qualitative feedback
Reynolds, 2010	Live: group sessions	2 weeks (1.5 hours per session with 3 sessions in total)	Single group experiment	Taxi drivers (40)	Adult learning theory	Knowledge (age and disability)
Rochette et al., 2017	Live: group sessions	3 hours	Quasi-experimental	Retail staff (18)	Experimentation, traditional knowledge transfer	Knowledge, confidence
Rudstam et al., 2013	Both live and online: blended learning	4 hours (8 modules)	Survey	Employees (287)	Grounded theory	Knowledge, attitude, intentions

Study methods as well as training design varied greatly. The most common method of delivery was face-to-face group sessions and there were two examples of online learning (Forrest, 2007; Rudstam et al., 2013). Sessions ranged from one session of three hours to one session a week over five weeks (Forrest, 2007; Rochette et al., 2017). Studies adopted mostly experimental designs with two quasi-experiments and two single group experiments. Although there is a risk of bias in both these designs with regards to random assignment of participants and the lack of a control group in the single group design (Evans, 2003). Samples were from different organisations including, police officers, taxi drivers, library staff, retail staff, and a survey of all types of employees.

Consistent with Paluck and Green's (2009) request for theory-driven interventions, the studies were examined for their application or consideration of theory in their design and interpretation of findings. Two of the studies made no reference to theory (Bailey et al., 2001; Forrest, 2007) whereas the other three mentioned theories in their explanation of the findings rather than developed their interventions based on theory. The theories drawn on to explain the outcomes included adult learning theory, knowledge transfer, and grounded theory (Reynolds, 2010; Rochette et al., 2017; Rudstam et al., 2013). None of these directly explain why the interventions were effective for the specific outcomes and in these specific contexts (Porter & Halloran, 2012). There were however references made to literature that argues that simulating disability in able-bodied learners is an effective method in increasing disability awareness (Flower et al., 2007). Some of the studies used simulation exercises (Bailey et al., 2001; Reynolds, 2010; Rochette et al., 2017). Nevertheless, the quality of this evidence is weak and there are strong arguments that simulating a disability is inappropriate and reinforces the medical model and ableist stereotypes (Burgstahler & Doe, 2004; Nario-Redmond et al., 2017). Plus, simulating disability is only applicable to some disabilities that are visible rather than invisible.

In addition to the lack of theory, there was also limited information about how the training was developed, who developed it, and what it was developed from. There were references to the literature being a basis for development, but these points were not developed or explained in the context of the outcomes being assessed. Studies that included online learning provided a list of the module titles, but it was less clear about the content within these modules. Forrest (2007) adopted a framework to their intervention titled the ADDIE model which outlines how the intervention should be implemented and evaluated. Finally, most interventions were based on intellectual, visible or general disability awareness and knowledge rather than knowledge specific to a condition. None aimed to increase knowledge about neurodevelopmental conditions, including ADHD.

When measuring outcomes, the most common was an assessment of knowledge about disabilities which featured in four of the studies (Forrest, 2007; Reynolds, 2010; Rochette et al., 2017; Rudstam et al., 2013). Knowledge was measured using a range of methods, from asking participants directly whether their knowledge increased or by creating awareness quizzes. These quizzes were notably not assessed for reliability or validity, so it is unclear whether they are replicable or robust. Two studies measured attitudes. Bailey et al., (2001) adopted the Attitudes towards Mental Retardation and Eugenics (AMRE) questionnaire and Rudstam et al., (2013) used the Barrier Intervention Assessment Tool (BIAT) to measure attitude along with knowledge, behaviour, and intention. These measures differ greatly and the AMRE is outdated and inappropriate for use in current research. Data related to outcomes were either qualitative where participants were asked to provide open-ended responses to questions or they were quantitative like the measure of attitude used in the Bailey et al., (2001) article. A mixed methods approach to assessing outcomes is often desired in intervention research because it generates more rigorous evidence, include different perspectives, and can help with integrating findings (Fetters et al., 2013).

In sum, the present study was designed with the aim to build on the limitations of existing literature. These advancements included adopting a randomised-control design to ensure rigour and reduce bias. Designing a theory-led intervention through the application of the theory of planned behaviour and social cognitive theory (Ajzen, 2011; Schunk, 1989). Using validated scales to assess outcomes and measure actual knowledge rather than self-reported knowledge. Furthermore, the addition of intention and behaviour helped investigate the link between the transfer of knowledge to behaviour. Finally, previous research neglects to increase awareness of neurodevelopmental conditions and focuses on improving knowledge rather than influencing the practical element of reasonable adjustments. Reasonable adjustments can be requested in any organisation and therefore, training developed should be applicable across sector types, and available to a range of employees.

Workplace Learning

Workplace learning can be delivered in a variety of formats. The purpose of the adjustment in the present study is to reach a wide range of managers and HR professionals. E-learning is a format that can achieve this whilst remaining consistent in delivery and evaluation (DeRouin et al., 2005). Literature reviews involving practitioner and research perspectives have identified that although e-learning is becoming an increasingly well utilised platform for employee training, there has been limited research assessing the effectiveness (Welsh et al., 2003). Systematic reviews

have explored the effectiveness of e-learning more broadly although the results are inconclusive due to the limited published resources to draw upon (Sinclair et al., 2016). Nevertheless, initial findings do indicate that e-learning is more effective than traditional training in encouraging changes in behaviour (Sinclair et al., 2016).

Rationale

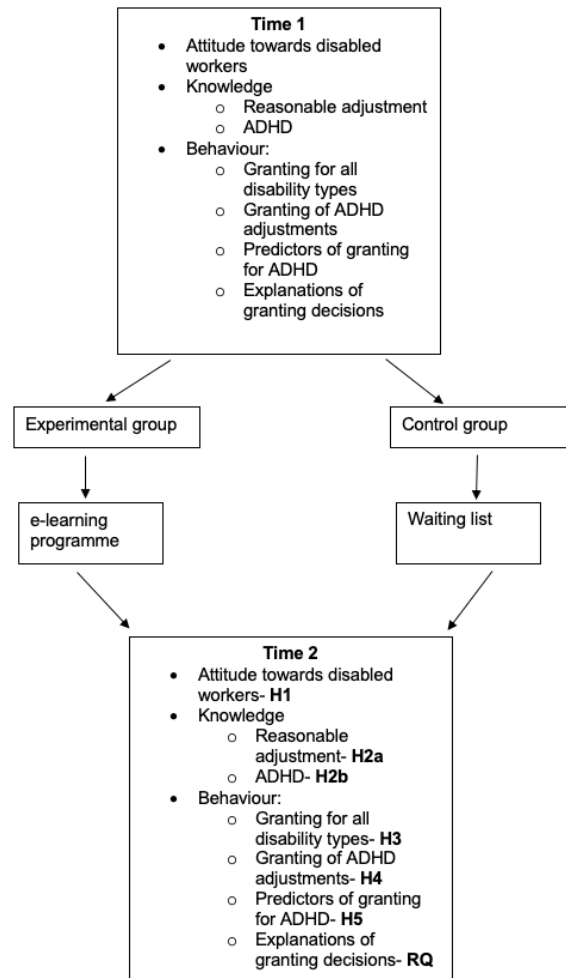
The present study attempts to investigate the efficacy of an e-learning intervention aimed at line managers and HR professions with the intention to increase knowledge about ADHD and reasonable adjustments, and consequently improve the likelihood of granting appropriate reasonable adjustments for adults with ADHD.

Hypotheses, Design and Research Question

The hypotheses and research questions adopt the framework of changes to attitude, knowledge, and behaviour commonly seen in intervention research. Data that is analysed in Chapter Seven refers to the baseline measures and is defined as Time 1 and the data collected during and after the e-learning programme for the experimental group and the data collected after a week without the programme for the control group is referred to as Time 2. The study employed a mixed factorial design combining between-group and within-group differences. Therefore, the between group variables are the experimental and control groups which were allocated randomly, adopting a randomised control design. The within group variables are the differences in each participant between Time 1 and Time 2 on measures of attitude, knowledge, and behaviour. Vignettes are used as stimuli to replicate adjustment requests at Time 2 as well as Time 1, they are included as within group variables because each participant was presented with vignettes that differed in type of disability for (autism, ADHD, physical disability, and mental health condition). A visual depiction of how the study design addresses the associated hypotheses can be found in Figure 8.1.

Figure 8.1

Study outline with hypotheses and research question



The first two hypotheses address the initial aim to investigate the efficacy of the intervention in increasing attitude and knowledge, whereas the remaining three hypotheses focus on the effects of a potential increase in knowledge on the intention to grant reasonable adjustments. The research question is related to the evaluation of the qualitative explanations to whether to grant or not grant the adjustments. The five hypotheses and research question are as follows:

Attitude.

H1: There will be a significant positive change in attitude towards workers with disabilities from Time 1 to Time 2 in the experimental group but not the control group.

Knowledge.

H2: There will be a significant increase in a) reasonable adjustment and b) ADHD knowledge from Time 1 to Time 2 in the experimental group compared to no significant increase in the control group.

Behaviour/Granting.

H3: There will be a significant increase in overall granting from Time 1 to Time 2 in the experimental group compared to no increase in the control group.

H4: There will be a significant increase in ADHD type granting from Time 1 to Time 2 in the experimental group compared to no increase in the control group.

H5: There will be a greater increase in ADHD ratings (compared to other types of disability) of a) empathy, b) legitimacy, c) necessity, d) cost, e) reasonableness, and f) granting, in the experimental group between Times 1 and 2, but not the control group.

Research question: Are there qualitative differences in reasons to grant or not to grant adjustments in the experimental group after the intervention compared to the control group?

Method

Participants

Of the 116 participants who completed the survey at Time 1, 113 signed up to complete the e-learning programme where they were randomly assigned to the experimental ($n = 66$) or control ($n = 47$) group. The completion rate of the study was 54% with more participants completing the study in the experimental group ($n = 37$) compared to the control ($n = 25$). There were no large variations in demographic details of both the experimental and control groups. Approximately 22% of participants had received previous training on disabilities, 76% were employed full-time, and 56% were line managers. A breakdown of the demographics by group is detailed in Table 8.2.

Table 8.2

Demographic details of the experimental and control groups

		Experimental	Control
Gender	Male	12	5
	Female	25	20
Job role	Line manager	24	11
	HR professional	13	15
Employment status	Full-time	29	19
	Part-time	8	7
Training on disability	Yes	8	6
	No	29	20

Measures

Details of the measures used in this study are outlined in detail in Chapter Seven where the Time 1 data are described. The measures of attitude, knowledge and granting was measured using the same methods at Time 2. Attitudes were measured using the adapted scale from Telwatte et al's (2017) study which assesses productivity perceptions and helpfulness towards employees with disabilities (Scherbaum et al., 2005). ADHD knowledge was measured using the ADHD knowledge scale (Bramham et al., 2009), and reasonable adjustment knowledge was measured using the scale developed prior to Time 1. At Time 2, the reliability analyses for the attitude measure and ADHD knowledge were deemed high $\alpha = .72$ and $KR_{20} = .77$, respectively. Reliability of the reasonable adjustment knowledge measure rose from $KR_{20} = .53$ at Time 1 to $KR_{20} = .58$ at Time 2 however, this can be considered adequate as it is above .50 (McGahee & Ball, 2009). Internal consistency was adequate-good for the attitude measures ranging from $\alpha = .60-.82$.

Vignettes

All participants were asked to rate a total of eight vignettes each. Half of the vignettes were administered at Time 1 and the remaining four were administered at Time 2. Participants were asked to rate the vignettes using the same items of empathy, legitimacy, necessity, cost, reasonableness, and likelihood to grant the adjustment. As with Time 1, participants were also asked to provide an open-ended response to justify their decision. Each factor- group and type of disability is fully crossed forming the vignettes (2x4) as per Table 8.3.

Table 8.3

Vignettes per participant

Vignettes per participant	Time 1	Time 2
Disability type	ADHD (x1)	ADHD (x1)
	Physical (x1)	Physical (x1)
	Mental health (x1)	Mental health (x1)
	Autism (x1)	Autism (x1)

E-learning Programme Feedback

Kirkpatrick developed a four level training evaluation model for organisations in 1954 and it has been applied and adapted since (DeRouin et al., 2005). The four

components involve a) reactions, b) learning, c) behaviour and, d) results. The a) reactions are usually attributed to whether the learners liked the intervention or not and the b) learning is whether the learning objectives were met or not (Kirkpatrick & Kirkpatrick, 1975). The c) behaviour refers to the transfer of the training to workplace behaviour and the d) results is the overall outcomes associated with the training (Kirkpatrick & Kirkpatrick, 1975).

After the study was completed, participants were asked to indicate the extent to which they agree with ten statements about the programme. Eight items were developed from the four components. An example of an item related to behaviour is “I intend on implementing what I have learnt from the e-learning programme in my organisation”. Participants responded on a 5-point Likert scale from strongly agree to strongly disagree. Self-confidence about learning and computer use has been shown to be an important mediator in learning online (Rochette et al., 2017). Therefore, two items about self-efficacy when using the e-learning programme were included and participants responded similarly to the other eight items. Reliability for the feedback scale was good $\alpha = .82$ although the item asking whether the programme could have been longer was removed for being ambiguous (Cronbach, 1988; Field, 2009).

Procedure

Participants were asked to complete the Time 1 survey and indicate their interest in the e-learning programme. They were then allocated to either the experimental or control group at random using a random number generator. The participants allocated to the experimental group were provided with the details of how to access the e-learning programme via email and given a unique username so that their data could be stored anonymously. They were also given four weeks to complete the programme (actual average time before completion was 30 days) and on average it took one hour to complete. Those who were allocated the control group were informed that they would receive another survey to complete in a week's time and once they completed this they would be given access to the e-learning programme. Time 2 data were collected on average 22 days after Time 1 for the control group. The e-learning programme consisted of quizzes which collected the knowledge-related Time 2 data for those allocated to the experimental group and then the remaining measures were collected in a survey after completion of the programme.

The study received ethical approval from the Birkbeck ethics committee. Participants were remunerated by receiving an e-booklet summarising the topics covered during the programme at the end of the course. They were also provided with the choice to enter into a prize or for the researchers to donate £3 to the ADHD Foundation on their behalf.

The e-learning Programme

The intervention was developed using an e-learning platform called *Articulate*. E-learning has several advantages for both the trainer and the trainees in organisations (Maes & Isaacs, 2016). For the trainee information overload is reduced in e-learning programmes compared to more traditional programmes because trainees can work at their own pace (Sinclair et al., 2016). When investigating effectiveness of e-learning, an advantage is that trainers are able to be consistent in the delivery which is beneficial for experimental research because it removes potential extraneous variables related to trainer differences often found in traditional forms of training delivery (Welsh et al., 2003). Furthermore, e-learning enables the trainer to observe trainee engagement by collecting additional data such as the amount of times the trainee logs in (DeRouin et al., 2005). Findings from a review of the literature were considered in the design of the e-learning programme to minimize drop out and maximise engagement (Kulik & Kulik, 1991; Welsh et al., 2003).

As per best practice guidelines, learning material was presented to the participants through a number of methods; reflective tasks, videos simple drag and drop matching activities, and readings (Welsh et al., 2003). There were two quizzes and seven sections of the programme (see Table 8.4). *Articulate* enables the administrator to limit access to further topics unless the quizzes or assessments are complete, therefore, participants will be unable to move to the next topic unless they have completed the relevant assessments. The materials were developed and informed from the research conducted throughout the thesis, lived experience, and independent research of legal advice. By developing the material prior to the e-learning commencing, the design can be classed as asynchronous e-learning rather than learning in real time or live which is an advantage in that participants are able to access the programme at any time and exit and come back to it at a later time (Hrastinski, 2008).

Table 8.4*E-learning topic overview with length of time to complete and evaluation*

Section no	Topic	Time to complete	Evaluation
1	Defining disability and the Equality Act	5 minutes	
2	Reasonable adjustments	5-10 minutes	
3	Reasonable adjustment examples	5 minutes	
-	Quiz	2-3 minutes	Reasonable adjustment knowledge scale
4	Defining ADHD	10 minutes	
5	Workplace challenges associated with ADHD	5-10 minutes	
-	Quiz	5 minutes	ADHD Knowledge (Barham et al., 2009)
6	Workplace strengths associated with ADHD	5 minutes	
7	Reasonable adjustment examples for ADHD	5 minutes	
			E-learning evaluation and vignettes (x4)

Figure 8.2

Screenshots from the e-learning programme

Reasonable adjustments and Neurodiversity in the workplace WL

100% COMPLETE

- Study Information
- Disability and the Equality Act
- Reasonable adjustments
- Reasonable adjustment examples
- What is ADHD?
- ADHD in the workplace
- ADHD Strengths
- Reasonable adjustments for ADHD

Neurodiversity

Definition

- Differences in brain function is a part of natural variation in the human population
- Emphasis placed on differences, not impairments
- Originated from a movement where individuals with Autism wanted to be seen as different, not disabled

Neurodiversity includes many hidden disabilities such as:

Reasonable adjustments and Neurodiversity in the workplace WL

50% COMPLETE

- Study Information
- Disability and the Equality Act
- Reasonable adjustments
- Reasonable adjustment examples
- What is ADHD?
- ADHD in the workplace
- ADHD Strengths
- Reasonable adjustments for ADHD

Workplace challenges

Please watch the video below which outlines common challenges for employees with ADHD

Reasonable adjustments and Neurodiversity in the workplace WL

100% COMPLETE

- Study Information
- Disability and the Equality Act
- Reasonable adjustments
- Reasonable adjustment examples
- What is ADHD?
- ADHD in the workplace
- ADHD Strengths
- Reasonable adjustments for ADHD

Evidence-based approach

- When implementing reasonable adjustments it is best to take an evidence-based approach
- This means selecting reasonable adjustments that are known to be effective
- There is limited research on effective reasonable adjustments for all disabilities, especially ADHD
- There are some websites which provide advice and guidance on reasonable adjustments
- The first website listed below provides a taxonomy of reasonable adjustments and the second provides useful summaries about the existing evidence-base/research on a variety of workplace matters

askjan.org
This website provides a taxonomy of disabilities with suggested relevant reasonable adjustments

Affinity hub
Another website provides helpful information about the most up-to-date research and practice in work-related well-being

CONTINUE

Reasonable adjustments and Neurodiversity in the workplace WL

100% COMPLETE

- Study Information
- Disability and the Equality Act
- Reasonable adjustments
- Reasonable adjustment examples
- What is ADHD?
- ADHD in the workplace
- ADHD Strengths
- Reasonable adjustments for ADHD

Assess

Step 2

- Once requested, the employer must agree on whether to grant a reasonable adjustment to the employee.
- Most adjustments are inexpensive and simple to implement.
- Employees who request reasonable adjustments must be involved in the assessment of what is required.
- There is no formal process of how to assess for the reasonable adjustment but here are some questions that you may like to think about:
 - How can we remove the barriers that the employee faces?
 - What has worked in the past for the employee?
 - What would be the most effective and practical adjustment for all parties?

1 2 3 4 5 ✓

User Testing and Survey Pilot

The e-learning programme and measures to be completed before and after were tested with a small group ($n = 4$) all with different knowledge and experiences. Two participants had no prior knowledge of neurodiversity and provided detailed feedback on the user experience of both the surveys and the e-learning programme using the think aloud technique where participants are asked to verbalise their thoughts (Jääskeläinen, 2010). The remaining two participants had knowledge of neurodiversity and were doctoral researchers with research experience, therefore they assisted with providing feedback on the survey items, participant information, and accuracy of ADHD information. A summary of the feedback and consequent amendments are presented below.

Item Wording and Language

As discussed in the materials section, feedback from the pilot study on the original reasonable adjustment items was that they were difficult to understand, and a few items did not reflect the legal terms in UK such as, 'undue hardship'. As a result of this feedback a UK version of the reasonable adjustment scale was developed and validated for the purpose of this study.

The language in two of the items of the ADHD scale were highlighted as confusing and there was feedback from the attitude items that they are dependent on situations so were difficult to answer. To make these less ambiguous, there were amendments to the instructions to make it clearer. To check the language within the e-learning programme I ran the text-based material through a Flesch Kincaid readability test website to assess the readability (Burke & Greenberg, 2010). The results indicated that the information is difficult to read with a reading ease score of 36.9 and grade level 12.3 which is a reading level of 18-19 year olds or college entry level. It is assumed that college level is appropriate for the purpose of this study because the words identified as difficult were neurodiversity and neurodevelopmental which were defined in the programme. In future, a review of the language would be needed to ensure it is more accessible for those without college level education.

User Instructions and Framing

Feedback on the user experience was generally positive and participants reported that they enjoyed the interactive elements, for example, the drag and drop exercise and reflective tasks. There were positive verbalisations about the overall presentation of information and the aesthetic look. At the time of the pilot, there was only one video and one participant suggested having more videos, so another was created to replace some written content.

The original study design proposed that participants in the experimental group should wait a week after completing the first survey before providing access to the e-learning programme. It was envisioned that this would reduce recency effects (Baddeley & Hitch, 1993). However, feedback suggested this was too long and increased the risk of drop-out. Therefore, as the study participants were expected to increase their scores on the measures it was deemed unnecessary to make them wait a week before giving access and collecting Time 2 data.

One final suggestion from the pilot group was to better emphasise the benefits to the participants for taking part. A review of the advertisements was conducted along with the pilot participants to ensure this was achieved.

Analyses

A variety of statistical methods were applied to examine the efficacy of the intervention using the statistical packages IBM SPSS version 23 and *R*. Both correlations and analysis of variance were used to assess the respective hypotheses. The research question was analysed using both content and thematic analysis. To investigate whether the missing data was missing at random the Missing Completely at Random (MCAR) test was conducted (Little, 1988). The test confirmed the missing data is random $\chi^2 = 1074.09$, $df = 1370$, $p = 1.0$. Substitution of the mean for the missing data have a negative impact on the violation of assumptions and was consequently not used (Graham, 2009). Therefore, the data was analysed without missing data manipulations.

Results

The results section is structured around the hypotheses and research question. First, there is an analysis of attitudes, then knowledge, followed by behaviour which in this case is predictors and likelihood to grant adjustments. There is an examination of the qualitative data in relation to the research question and the results conclude with the feedback of the e-learning programme.

Attitude

H1: There will be a significant positive change in attitude towards workers with disabilities from Time 1 to Time 2 in the experimental group but not the control group.

An overall score of attitudes towards workers with disabilities was computed as well as separate scores for the subscales of perceived productivity and helpfulness. The experimental group had significantly more positive ratings of attitude for the overall attitude score $t(110) = 2.49$, $p < .05$, $d = .73$, and the perceived helpfulness score $t(110) = 2.42$, $p < .05$, $d = .46$ at Time 1 compared to the control group. Examination of

demographic differences between the two groups indicated that this was most likely due to chance with groups being close to equal on experience, size of organisation, gender, length in role, and position. These high scores were also higher than the mean scores in prior research ($M = 4.65-5.32$) indicating that the sample are already high on positive attitudes towards workers with disabilities and could also be an example of volunteer bias (Salkind, 2010; Telwatte et al., 2017). Table 8.5 displays the means and standard deviations for all measures of attitude.

Table 8.5

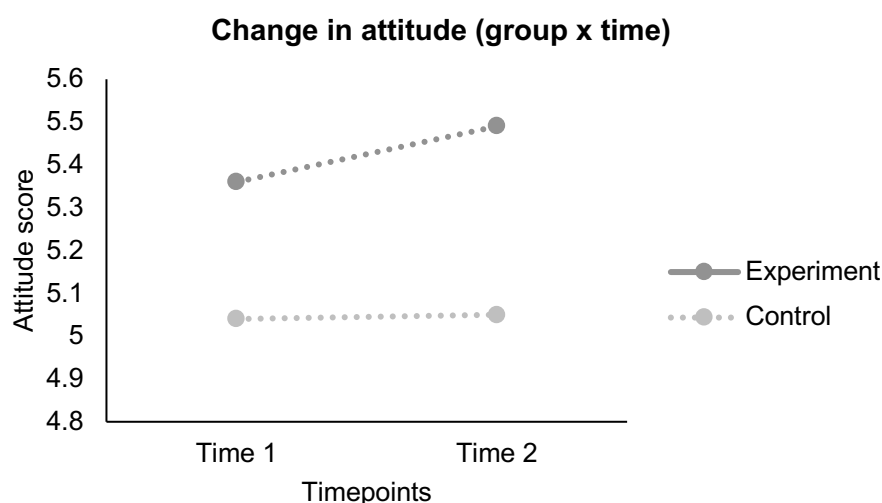
Means and standard deviations for measures of attitude in the experimental and control group at Times 1 and 2

	Experimental		Control	
	Time 1 <i>M (SD)</i>	Time 2 <i>M (SD)</i>	Time 1 <i>M (SD)</i>	Time 2 <i>M (SD)</i>
Overall attitude	5.35 (.46)	5.49 (.32)	5.04 (.38)	5.05 (.38)
Perceived productivity	5.05 (.60)	5.14 (.54)	4.76 (.55)	4.70 (.55)
Helpfulness	5.66 (.40)	5.85 (.24)	5.32 (.43)	5.40 (.49)

A two-way mixed factor ANOVA was run on the three different measures after assumptions for normality, homogeneity of variance and homogeneity of covariance were met as well as no outliers identified from the studentized residuals. The main effect was not significant for overall attitude $F(1,50) = 1.67, p = .18$, perceived productivity $F(1,61) = 1.08, p = .30$, or helpfulness $F(1,50) = 1.18, p = .28$ (see Figure 8.3). Two paired samples t-tests were run on the experimental and control group. There was a significant increase between Time 1 ($M = 5.66, SD = .40$) and Time 2 ($M = 5.85, SD = .24$) on helpfulness for the experimental group but not the control $t(25) = -3.31, p < .01$. Therefore, the Hypothesis 1 was not supported.

Figure 8.3

Overall attitude between Time 1 and Time 2 for both experimental and control group



Knowledge

H2: There will be a significant increase in a) reasonable adjustment and b) ADHD knowledge from Time 1 to Time 2 in the experimental group compared to no significant increase in the control group.

Although at baseline, the experimental group had higher scores in both reasonable adjustment knowledge ($M = 7.58$, $SD = 1.57$) and ADHD knowledge ($M = 12.86$, $SD = 3.54$) compared to the control group ($M = 7.24$, $SD = 1.75$; $M = 11.70$, $SD = 3.37$), these differences were not significant ($t(111) = .87$, $p = .38$, and $t(111) = 1.84$, $p = .07$, respectively). Assumptions of normality and homogeneity were met for both the dependent variables so a 2x2 mixed ANOVA could be conducted assessing the differences between time points as well as the groups.

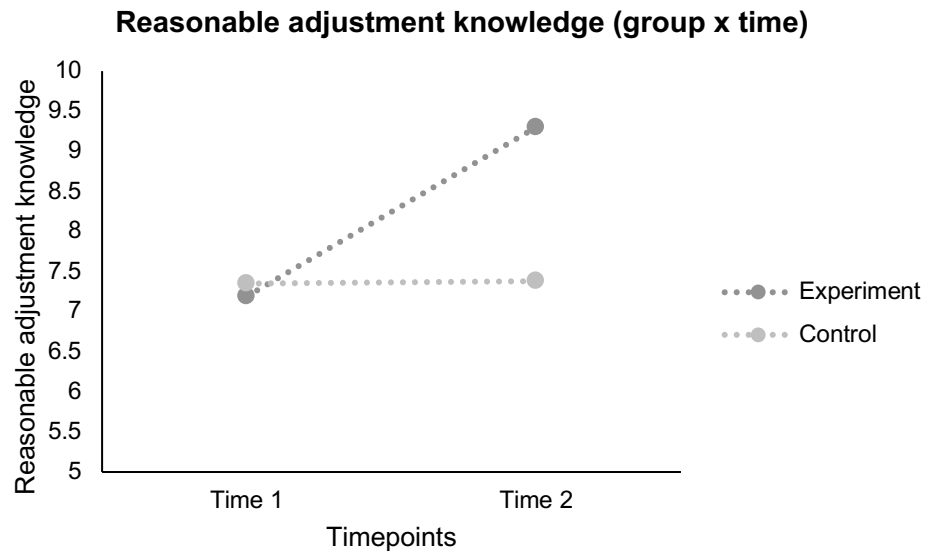
a) Reasonable Adjustment Knowledge

There was a significant difference across the two time points $F(1,61) = 31.90$, $p < .001$ and significant differences between groups, $F(1,61) = 8.74$, $p < .001$ in reasonable adjustment knowledge. There was also a significant interaction between the group (experimental and control) and the time of assessment (pre and post intervention), $F(1,61) = 29.66$, $p < .001$, $\eta^2 = .33$ (see Figure 8.4). To further break down the interactions, two one-way repeated measures ANOVAs were conducted on the experimental and control group. For the experimental group, the increase in knowledge between time 1 and 2 was statistically significant $F(1,36) = 70.84$, $p < .001$, $r = .81$, whereas the difference between timepoints for the control group was not significant $F(1,25) = .02$, $p = .89$. Therefore, the e-learning programme significantly

increased reasonable adjustment knowledge with a large effect size (Richardson, 2011).

Figure 8.4

Change in reasonable adjustment knowledge between Time 1 and Time 2 in both experimental and control group

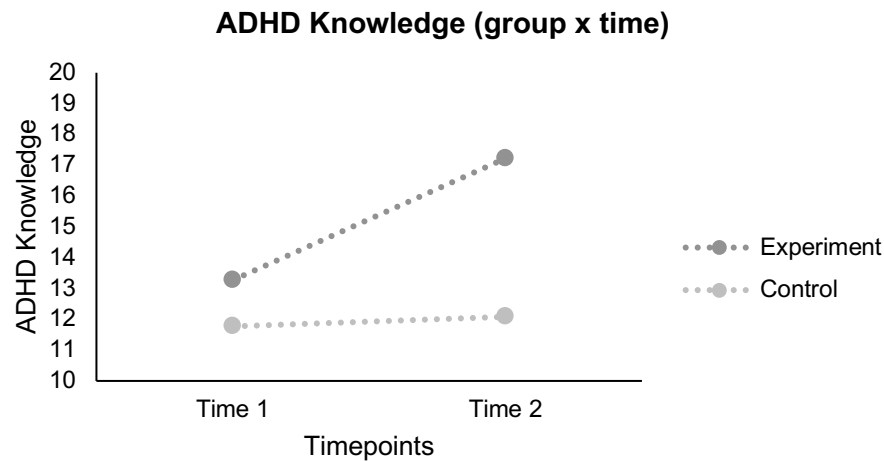


b) ADHD Knowledge

As with reasonable adjustment knowledge, there was a significant difference across the two time points $F(1,61) = 25.79, p < .001$ and between groups, $F(1,61) = 32.84, p < .001$ for ADHD knowledge. There was also a significant interaction between the group and the time of assessment, $F(1,61) = 18.87, p < .001, \eta^2 = .24$ (see Figure 8.5). To further examine the interactions, two one-way repeated measures ANOVA's were conducted on both the groups. For the experimental group, the increase in knowledge between Time 1 and 2 was statistically significant $F(1,36) = 42.34, p < .001, r = .54$, whereas and the difference between timepoints for the control group was not significant $F(1,25) = .37, p = .55$. Therefore, the e-learning programme also significantly increased ADHD knowledge with a large effect size providing support for hypothesis 1 (Richardson, 2011).

Figure 8.5

Change in ADHD knowledge between Time 1 and Time 2 in both experimental and control group



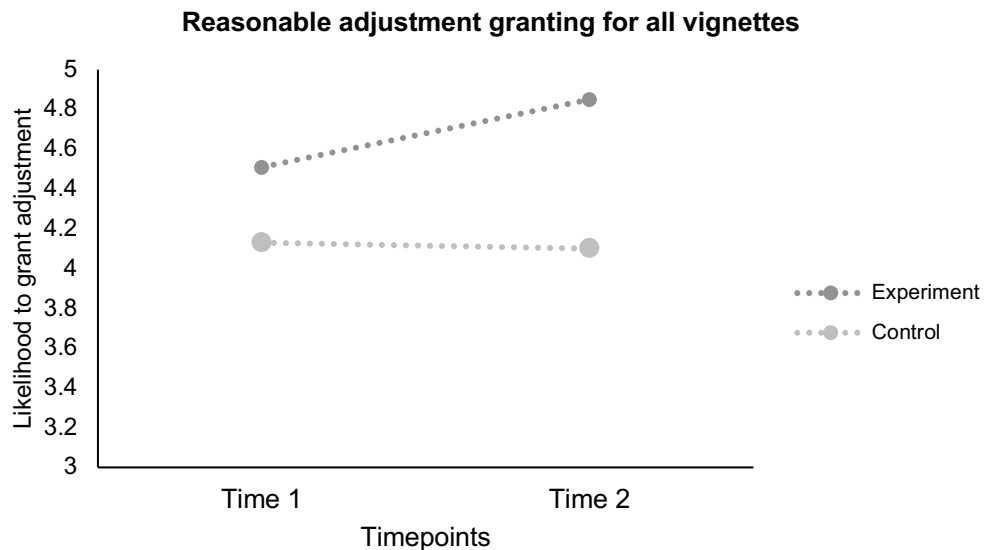
Behaviour/Granting

H3: There will be a significant increase in overall granting from Time 1 to Time 2 in the experimental group compared to no increase in the control group.

Prior to running a mixed ANOVA, assumptions for normality and homogeneity of variance were run on the dependent variables in both groups. Both assumptions were violated and continued to be so after a log transformation (Field, 2009). As a result of the violations, a non-parametric equivalent of mixed ANOVA is recommended (Field, 2012). A robust mixed factorial ANOVA on the trimmed means using the *R* package WRS2 was conducted (Mair & Wilcox, 2020). The main effects of group and time were statistically significant, $F(1,18.74) = 24.80, p < .001$ and $F(1,25.09) = 9.39, p < .01$, respectively. There was a significant interaction effect $F(1,25.09) = 13.09, p < .01$ (see Figure 8.6). Two separate robust two-way repeated measure ANOVAs were calculated on the experimental and control group to investigate the interaction effect. An increase in granting between time 1 and time 2 in the experimental group was statistically significant $F(1,22) = 33.83, p < .001, r = .78$, whereas there was no difference in granting in the control group between the two timepoints $F(1,14) = .11, p = .74$. Therefore, hypotheses 3 that the intervention would lead to increases in granting for the experimental but not the control group was supported with a large effect size.

Figure 8.6

Likelihood to grant adjustments for all vignettes in the experimental and control group at Times 1 and 2

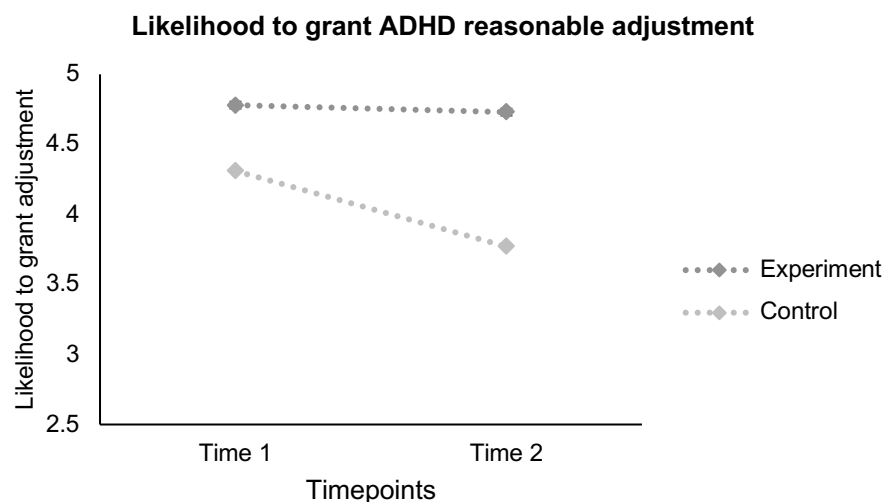


H4: There will be a significant increase in ADHD type granting from Time 1 to Time 2 in the experimental group compared to no increase in the control group.

Preliminary analyses testing for violations of assumptions found that assumptions of normality and homogeneity of variance was violated. A second robust mixed ANOVA was therefore conducted using the *R* package WRS2 (Mair & Wilcox, 2020). There was a statistically significant main effect of group $F(1,15) = 26.13, p < .001$ but not time $F(1,15) = 4.11, p = .06$. The interaction was not statistically significant $F(1,15) = 4.11, p = .06$. Examination of the means indicate that in both groups the means decreased from Time 1 to Time 2 (see Figure 8.7). To investigate the effects further a Mann Whitney U test on the median change scores revealed a non-significant difference between the experimental and control group granting scores for ADHD, $U = 374, z = -1.55, p = .12$. There was however a significant difference in median scores in the experimental and control group at Time 1 $U = 303, z = -2.83, p < .01$ and Time 2 $U = 200, z = -4.38, p < .001$ with the experimental group being more likely to grant ADHD adjustments at both times. Therefore, the fourth hypothesis was not supported.

Figure 8.7

Likelihood to grant ADHD adjustment in experimental and control groups at Time 1 and 2



H5: There will be a greater increase in ADHD ratings (compared to other types of disability) of a) empathy, b) legitimacy, c) necessity, d) cost, e) reasonableness, and f) granting, in the experimental group between times 1 and 2, but not the control group.

A three-way mixed factor ANOVA was run on group x time x type of disability for each of the ratings of empathy, legitimacy, necessity, cost, reasonableness, and granting to see if there was an increase in ADHD scores compared to the other types of disability. It must be noted that assumptions of normality were violated for some variables and although ANOVAs are argued to be robust to violations of normality, in these cases the non-parametric Mann-Whitney test on the median scores and Bonferroni corrections were applied when examining contrasts to mitigate the risk of a Type 1 error (Field, 2012). Mauchly's test indicated that the assumption of sphericity had been violated for the main effects of type of disability for legitimacy $X^2(5) = .49, p < .001$, necessity $X^2(5) = .80, p < .05$, cost $X^2(5) = .81, p < .05$, and granting $X^2(5) = .71, p < .01$. Therefore, degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity where relevant (Field, 2009). Table 8.6 displays the means and standard deviations for each variable separated by group, time, and type of disability as well as the corresponding three-way mixed ANOVA main effects and interactions.

Table 8.6

Means and standard deviations of both the experimental and control group at Time 1 and Time 2 with the corresponding mixed ANOVA effect, f ratio, df , and η^2 for ratings of empathy, legitimacy, necessity, cost, reasonableness, and likelihood to grant reasonable adjustment vignettes

Variable		Experimental		Control		2x2x4 mixed ANOVA			
		T1 M (SD)	T2 M (SD)	T1 M (SD)	T2 M (SD)	Effect	F-ratio	df	η^2
Empathy	ADHD	4.74 (.44)	4.86 (.54)	4.52 (.78)	4.54 (.65)	Time x Group	1.58	1	
	Autism	4.73 (.45)	4.89 (.32)	4.63 (.65)	4.62 (.70)	Type x Group	1.41	3	
	MH	4.62 (.60)	4.92 (.28)	4.47 (.55)	4.62 (.50)	Time x Type	1.41	3	
	PD	4.83 (.48)	4.97 (.16)	4.79 (.59)	4.81 (.40)	Time x Type x Group	.23	3	.00
Legitimacy	ADHD	4.64 (.68)	5.00 (.00)	4.52 (.81)	4.46 (.95)	Time x Group	5.94*	1	.09
	Autism	4.77 (.53)	4.97 (.16)	4.72 (.72)	4.73 (.83)	Type x Group	1.70	3	.03
	MH	4.34 (.95)	4.97 (.16)	4.26 (.80)	4.35 (1.00)	Time x Type	3.08*	3	.05
	PD	4.95 (.21)	5.00 (.00)	4.83 (.74)	4.58 (.86)	Time x Type x Group	.92	3	.02
Necessity	ADHD	4.45 (.75)	4.73 (.65)	4.33 (.77)	3.73 (1.04)	Time x Group	6.56*	1	.10
	Autism	4.12 (1.06)	4.73 (.51)	3.93 (1.18)	4.19 (.85)	Type x Group	3.38*	3	.05
	MH	4.09 (.97)	4.81 (.40)	4.07 (.75)	4.23 (.71)	Time x Type	8.11***	3	.12
	PD	4.58 (.82)	4.97 (.16)	4.56 (.69)	4.65 (.63)	Time x Type x Group	1.47	3	.02

Cost	ADHD	3.73 (.90)	3.78 (.75)	3.23 (.95)	2.88 (.82)	Time x Group	3.88	1	.06
	Autism	3.43 (.90)	2.92 (.80)	3.19 (.80)	2.65 (.89)	Type x Group	2.82*	3	.04
	MH	3.68 (.88)	3.95 (.94)	3.73 (.72)	3.50 (.86)	Time x Type	9.34***	3	.13
	PD	2.95 (.74)	3.30 (.66)	2.65 (.63)	2.92 (.48)	Time x Type x Group	1.05	3	.02
Reasonablene SS	ADHD	4.50 (.75)	4.68 (.75)	4.15 (.92)	3.62 (.90)	Time x Group	7.08*	1	.10
	Autism	3.98 (1.00)	4.70 (.46)	3.57 (1.05)	3.77 (1.07)	Type x Group	3.45*	3	.54
	MH	4.27 (.65)	4.78 (.42)	3.98 (.72)	4.12 (.86)	Time x Type	8.48***	3	.12
	PD	4.58 (.53)	4.95 (.23)	4.37 (.74)	4.54 (.71)	Time x Type x Group	.65	3	.01
Granting	ADHD	4.78 (.48)	4.73 (.77)	4.31 (.79)	3.77 (1.03)	Time x Group	14.97***	1	.20
	Autism	4.11 (1.10)	4.78 (.42)	3.54 (1.17)	3.77 (1.03)	Type x Group	3.82*	2.59	.06
	MH	4.46 (.78)	4.92 (.28)	4.35 (.69)	4.19 (.69)	Time x Type	7.21***	2.44	.11
	PD	4.68 (.63)	4.97 (.16)	4.35 (.80)	4.65 (.56)	Time x Type x Group	1.27	2.44	.02

Note. MH = mental health condition, PD = physical disability, T1 = Time 1, T2 = Time 2. *p < .05, **p < .01, ***p < .001.

a) Empathy

A three-way mixed factor ANOVA did not reveal a significant interaction effect for empathy $F(3,183) = .23, p = .87$. Also, all main effects were not statistically significant.

b) Legitimacy

A three-way mixed factor ANOVA showed that the interaction effect of group x time x type of disability was not significant. The main effect of time x group $F(1,60) = 5.94, p < .05$ and the time x type $F(2.07, 124.4) = 3.08, p < .05$, were statistically significant.

Two separate repeated measures ANOVA's were conducted on the experimental and the control group to investigate the main effects. For the experimental group there was a significant interaction between time and type of disability $F(2.08,72.87) = 5.40, p < .01$, whereas the interaction for the control group was not significant. An overall increase in perceived legitimacy was found to be significant for the experimental group compared to the control group which decreased in perceived legitimacy ratings $U = 304, z = -2.42, p < .05$. When examining the types of disability, the only significant increase in legitimacy scores was for the experimental group on physical disability $U = 368.5, z = -2.58, p < .05$. There was a notable ceiling effect in the experimental group at Time 2 for both ADHD and physical disability where all participants responded with strongly agree (Salkind, 2010).

c) Necessity

A three-way mixed factor ANOVA indicated that the interaction effect of group x time x type of disability was not significant $F(2.60,158.67) = 1.47, p = .23$. The main effects of time x group $F(1,61) = 6.56, p < .05$, type x group $F(2.85,173.75) = 3.38, p < .05$, and time x type $F(2.60,158.67) = 8.11, p < .01$, were all significant. There is a significant increase in ratings of overall necessity in the experimental and not the control group $U = 311, z = -2.42, p < .05$. When comparing the change scores across the types of disability, ADHD was the only significant increase in scores in the experimental group compared to a decrease in the control group $U = 307.5, z = -2.78, p < .01$. All other scores increased in both groups but there were no significant differences between the experimental and control groups.

d) Cost

An examination of the three-way interaction for ratings of cost was not significant $F(2.65,161.82) = .11, p = .37$. The main effects of type x group

$F(2.97, 181.05) = 2.82, p < .05$ and time x type $F(2.65, 161.82) = 9.34, p < .001$ were significant. There were no significant differences when investigating the change scores between the groups. In addition, there were no differences in ratings of cost between the experimental and control group at Time 1. There was, however, a significant difference between ratings of cost for physical disability $U = 354, z = -2.32, p < .05$ and ADHD $U = 225, z = -3.81, p < .001$ at Time 2 with the experimental group rating the adjustments as cheaper compared to the control group.

e) Reasonableness

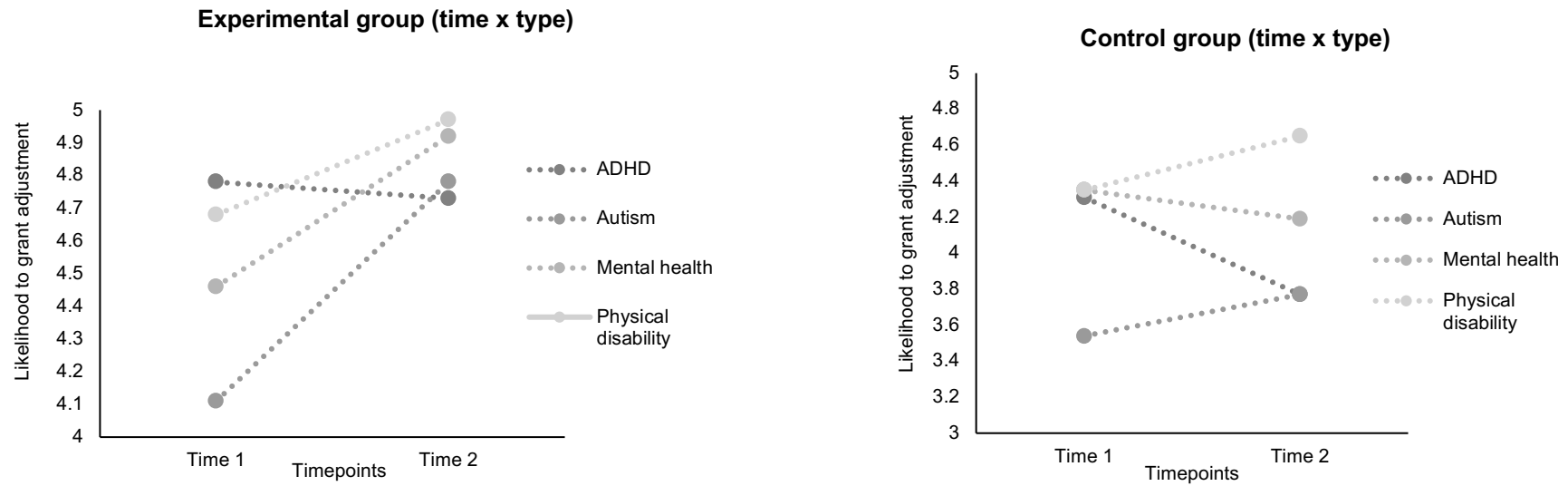
A three-way mixed ANOVA indicated that there was no significant interaction between group x time x type of disability $F(3, 183) = .65, p = .59$. However, the main effects of time x group $F(3, 183) = 3.45, p < .05$ and time x type $F(3, 183) = 8.48, p < .001$ were statistically significant. Ratings of reasonableness were statistically different at time 1 for types of disability between the experimental and the control groups with the experimental group rating reasonableness higher than the control group. Examination of the change scores show that ratings of reasonableness significantly increased for ADHD but not any other disabilities in the experimental group compared to the control group $U = 334.5, z = 2.23, p < .05$.

f) Granting

A three-way mixed ANOVA revealed a non-significant interaction for group x time x type $F(2.44, 148.85) = 1.27, p = .29$. Both main effects of type x group $F(2.56, 157.68) = 3.82, p < .05$ and time x type $F(2.44, 148.85) = 7.21, p < .001$ were statistically significant. Likelihood to grant the adjustments were higher for all disabilities (ADHD $U = 203.5, z = -4.46, p < .001$, Autism $U = 197.5, z = -4.45, p < .001$, mental health condition $U = 199.5, z = -4.82, p < .001$, and physical disability $U = 345.5, z = -3.12, p < .01$) in the experimental group at time 2. Although it is important to note that at time 1 the experimental group were also significantly more likely to grant the autism $U = 1140.5, z = -2.33, p < .05$ and ADHD type adjustment $U = 1161, z = -2.39, p < .05$. When examining change scores, there was a significant increase in granting for the mental health adjustment in the experimental group compared to the control group $U = 279.5, z = -3.18, p < .01$. These differences are displayed in the graphs in Figure 8.8.

Figure 8.8

Experimental and control group likelihood to grant adjustments at Time 1 and Time 2 compared by disability type



Research Question: Are there qualitative differences in reasons to grant or not to grant adjustments in the experimental group after the intervention compared to the control group?

A template was created from the core themes and sub themes identified at Time 1. This template formed the a priori template and was applied to the Time 2 qualitative data (King & Brooks, 2016). Prior to coding, the data was grouped by disability and by whether the data was from a participant in the experimental or control group. As the a priori template was applied to the dataset the template was refined by adding any new themes and removing unused themes (King, 2012). For example, no explanations involved questioning the legitimacy of the condition so this subtheme was removed from the template (King & Brooks, 2016). Two subthemes were added. These included comments explaining the adjustments are inexpensive and easy to implement as well as explanations that the adjustment is reasonable. Once the entire dataset had been coded, the template was finalised and then a frequency count of codes in each group was conducted to investigate whether there was a difference in the qualitative explanations, see Table 8.7.

Table 8.7*Content analysis of Time 2 reasons to grant or not grant reasonable adjustment divided by type of disability and group*

Core themes	Sub themes	ADHD		Mental health		Autism		Physical disability	
		Exp	Con	Exp	Con	Exp	Con	Exp	Con
Reasons likely to grant	Benefits individual	8	1	18	2	8	3	17	3
	Benefits organisation	9	2	14	1	2	2	14	7
	Personal experience	0	0	1	0	0	1	1	1
	Reasonable	6	3	10	1	5	6	10	7
	Low cost & easy to implement	10	3	6	2	2	0	11	4
Reasons unlikely to or conditions to grant	Suitability for the role	1	6	0	4	0	3	0	1
	Need for professional advice	0	0	0	0	0	3	0	0
	Negative impact on the team	2	1	1	7	0	0	0	0
	Negative impact on the manager	0	3	0	0	1	0	0	0
	Negative impact on the organisation finances	0	3	2	2	9	8	1	5
	Perceived incompetence	1	5	2	5	0	2	1	1

Note. Exp = experimental, Con = control.

Overall, the experimental group had fewer reasons not to grant the adjustment according to the content analysis. The subthemes related to reasons to grant the adjustment were more frequent in the experimental group indicating that participants were better able to explain the benefits of the adjustment to the individual and the organisation. The added subthemes formed from justifications of reasonableness and explanations related to how the adjustment would be inexpensive and easy to implement were more prevalent in the experimental group compared to the control group. To illustrate this theme, an anonymised quote from one participant can be found below:

“This adjustment would be completely inexpensive for the organization as they wouldn't need to change anything in order for the employee to feel comfortable. The employee just requires a place to de-stress before beginning work - which would help their productivity whilst at work and may mean that they are happier and reduce absence. Flexible working hours and frequent breaks mean that the employee would be able to focus more when they are doing their work and as a result, would make the quality of the work better”- (experimental group participant).

Conversely, subthemes related to reasons not to or conditions to grant the adjustments were present in both the experimental and control group. Although the experimental group were better able to justify why adjustments would be beneficial, there were questions raised about why some adjustments would be effective for both the autism and ADHD adjustments. For example, to highlight the differences in responses, a participant from the experimental group wrote “a job coach would be the most expensive, and the benefits of this would need to be further examined i.e. how would the job coach make her be able to do her job to a good standard”. Compared to a quote from a participant from the control group about the same adjustment which states “not clear why a job coach would assist someone with autism? This is likely to be the most costly item”. Referring to the specific adjustment of a job coach mentioned in the quotes, the e-learning programme provided evidence that coaching is an effective adjustment and also outlined the financial support available from the Access to Work scheme. Comments suggest that this was not well understood because a number of participants from the experimental group wanted more information and argued it would be expensive. These comments indicate that the transfer of knowledge gained from the e-learning programme may not have been successfully applied across contexts.

Usability and Design of the e-learning Programme

A total of 46 participants (37 in the experimental and 9 in the control group) provided feedback on the e-learning programme. Table 8.8 displays the correlations of scores. General reactions were positive with 89% of participants indicating they enjoyed the programme. From a learning perspective, the mean score was 4.33 which meant participants rated the content and the overall learning experience as positive with the maximum score being five. Furthermore, a total of 87% participants reported that they intended on implementing what they had learnt on the programme in their organisation. The usability of the programme was rated high with all but two participants (96%) feeling confident when using the programme and finding it easy to navigate. Relationships between the feedback levels and the outcome measures of knowledge and granting were examined. A significant partial correlation was found between reaction and learning when controlling for the effects of confidence $r(43) = .42, p < .01$ which is consistent with previous research (Rochette et al., 2017). In addition, behaviour, here measured as intent to use knowledge gained from the programme, was positively related to an increase in granting for both overall granting and ADHD specific which is also consistent with research that demonstrates the relationship between intentions and behaviour (Ajzen, 2011).

Table 8.8*Correlations of feedback scores*

	1.	2.	3.	4.	5.	6.	7.
1. Reaction							
2. Learning	.52**						
3. Behaviour	.12	.48**					
4. Confidence	.36*	.56**	-.03				
5. Change in RA knowledge	-.01	.10	.27	-.11			
6. Change in ADHD knowledge	.02	.05	.18	-.22	.33*		
7. Change in overall granting	.23	.27	.38**	-.11	.38*	.29	
8. Change in ADHD granting	.01	.11	.46**	-.26	.18	.22	.46**

* $p < .05$, ** $p < .01$, *** $p < .001$.

Discussion

The present study examined the efficacy of an e-learning programme on increasing positive attitude towards employees with disabilities, knowledge of ADHD and reasonable adjustments, and in turn improve the granting of reasonable adjustments in a sample of UK HR professionals and line managers. The findings associated with each element of attitude, knowledge, and behaviour are outlined below and discussed in context of the relevant theory and research.

Attitudes

Overall attitudes towards employees with disabilities did not significantly become more positive in the experimental group or the control group. When examining the dimensions, helpfulness towards employees with disabilities increased in the experimental but not the control group. The non-significant changes in overall attitude could be related to the measure being an explicit rather than implicit assessment of attitude and subsequently subject to social desirability (Cuddy et al., 2007; Greenwald & Banaji, 1995). Another reason is that attitude was already positive for the sample at Time 1 most likely due to the participant demographics mentioned in Chapter Seven. This volunteer sample consisted of mainly females working in psychology, health, and teaching roles, which tend to score positively on measures of attitude towards disabilities (Vornholt et al., 2013). Prior research has used contact theory to explain why there is an increase in willingness to help employees with disabilities (Pettigrew, 1998; Popovich et al., 2003). An increase in knowledge about certain conditions can increase the confidence and minimize fear when interacting with that person (Campbell et al., 2003). Increase in knowledge can come from both knowing about the condition and being in contact with someone with the disability (Campbell et al., 2003). Therefore, the information provided in the e-learning programme could have increased confidence and consequently improved attitudes towards helping employees with disabilities.

Knowledge

The primary aim of the e-learning programme was to increase knowledge of reasonable adjustments and ADHD. Findings indicate that although knowledge was higher for reasonable adjustments in this sample compared to the validation sample, the programme significantly increased both kinds of knowledge in the experimental group. These results are consistent with previous research that demonstrates the effectiveness of online programmes to increase knowledge (Forrest, 2007; Gayed et al., 2018; Wynants & Dennis, 2017).

The types of knowledge included in the e-learning programme varied from factual knowledge about what a reasonable adjustment is, where information can be sought, and what symptoms are related to ADHD, as well as conceptual knowledge like the social model of disability and neurodiversity (De Jong & Ferguson-Hessler, 1996). Each participant's prior knowledge base for each type of factual and conceptual knowledge would be different. It is expected that due to the heavy reliance on the medical model of disability in society, participants will know less about other ways of viewing disability, neurodiversity, and the strengths associated with ADHD. The measures of ADHD and reasonable adjustment knowledge did contain items that included common misconceptions and incorrect stereotypes such as "ADHD is a result of bad parenting" so to answer correctly participants will have had to be aware of these. Therefore, the increase in knowledge can be a result of the new factual and conceptual information challenging existing beliefs and resulting in conceptual change (Chi, 2008).

Behaviour

Behaviour was measured as the likelihood to grant reasonable adjustments. Overall, there was a significant increase in the likelihood to grant adjustments in the experimental group but not in the control group. However, there was a small decrease in likelihood to grant the ADHD related adjustment in both groups although they were not significant. When examining the predictors, the ADHD adjustment was observed to have the most significant changes between time points with perceived cost decreasing and necessity and reasonableness increasing. The perceived legitimacy increased, and the perceived cost decreased for the physical disability adjustment, yet the only significant increase in granting was for the mental health adjustment.

A template and content analysis of the reasons grant reasonable adjustments found that the e-learning programme increased the awareness and knowledge of why the reasonable adjustments would be beneficial to the employee and the organisation. In particular, the programme increased comments about how the adjustment would improve the employee's well-being, work life balance, productivity, performance, and inevitably reduce their symptoms. Additionally, the programme reduced the stereotypical views and comments about employees with disabilities that were identified at Time 1 in the experimental but not the control group.

The decrease in likelihood to grant the ADHD adjustment could be due to measurement error where there may actually be a difference in the adjustments themselves because both groups demonstrated this decrease. It could also be consistent with diversity research, in particular unconscious bias training, where simply an increase in awareness or knowledge is not enough to influence behaviour (Chang et

al., 2019; Noon, 2018). However, it must be noted that by chance, participants in the experimental group were more likely to grant the ADHD adjustment at Time 1 prior to the e-learning programme and this could be a result of the demographics of those who took part. Furthermore, participants who completed the entire study had higher ratings on ADHD empathy, necessity and granting compared to those who did not complete the study suggesting that those who needed to increase their knowledge were not targeted in this study. Research has suggested that diversity training that is mandatory has more impact on behaviour compared to volunteer training which has more impact on reactions (CEBMA, 2017). Empathy was also a significant predictor at Time 1 and it was not at Time 2 suggesting that legal reasoning rather than affective reasoning had more impact in the decision making process after the intervention. There is some evidence that empathy acts as more of a mediator in attitude change rather than a direct influence on behaviour (Madera et al., 2011).

The direct relationship between reasonableness and granting was identified in Chapter Seven and prior research (Telwatte et al., 2017). Interestingly, reasonableness and necessity significantly increased for the ADHD adjustment even though granting did not. These findings combined with the qualitative findings suggest that the programme provided participants with the justifications as to why the adjustment would benefit the individual and the organisation and therefore may have increased their awareness and knowledge to better justify their own decision making. As a result, they were better able to see why adjustments were necessary and reasonable for the person and learn that most adjustments are low cost which counteracts the misconception of adjustments being difficult and expensive to implement (Jackson et al., 2000). Change in cognitions are linked to the social cognition theory of categorization whereby when new knowledge or information conflicts with existing knowledge, there can be a reduction of category mistakes (Chi, 2008; McLean, 2011).

The increase in granting for the mental health adjustment is an important finding because it demonstrates that although the e-learning programme was not specifically about mental health conditions, there was a positive transfer effect. These findings are supported by previous research on disability training where the training was argued to increase the confidence and skills to apply across disabilities rather than the one identified in the training (Campbell et al., 2003). A study further argues that providing a space to store the knowledge covered which was provided in the form of an e-booklet can support the transfer of knowledge to actual behaviour (Tynjälä & Häkkinen, 2005). On the one hand, it must also be noted that the adjustment vignettes are hypothetical scenarios and actual behaviour may differ (Araten-Bergman, 2016).

Finally, the programme emphasised the importance of evidence-based decision making in relation to reasonable adjustments and hoped that there would be observations of this in the explanations for granting adjustments in the experimental group. The findings were inconclusive as the application of an evidence-based approach was not directly measured and is difficult to assess (Shaneyfelt et al., 2006).

Limitations and Future Research

An important limitation to be addressed in future application of the specific e-learning programme is that it is not accessible for managers/HR professionals with disabilities. Although the readability score was good and there were videos and short reflection tasks, the majority of the content was in written form and required a lot of reading. A first step to increase the accessibility of the written content would be to make it available via audio description but a full review of the accessibility would then be required to ensure it is deliverable in a variety of formats. Ensuring the programme is accessible is of integral importance for its future application and the research associated with it because of the values in which are discussed in the content of the programme as well as the demographic of those interested in disability training are more likely to also have a disability themselves (Farmer & Macleod, 2011).

There are several methodological limitations of the present study. The first is the small sample size which resulted from the large drop-out rate. This limitation is despite the sample being the largest compared to similar research investigating the efficacy of disability training (Forrest, 2007; Rochette et al., 2017; Wynants & Dennis, 2017). A larger sample size would improve the ability to detect small effects (VanVoorhis & Morgan, 2007). Future research would also need to encourage reduced drop-out rate possibly by adding a more meaningful incentive or making the training mandatory (Hoerger, 2010).

The second limitation relates to the outcomes and is based on the recommendation in organizational intervention research for process evaluation (Oakley et al., 2006). Whilst the study adopts a high quality and reduced bias method by adopting a randomised-control trial design, the data was only collected at two time-points (Evans, 2003). A process evaluation recommends collecting a wide range of types of data at multiple time points (Murta et al., 2007). For example, data in the present study could have included number of requests for adjustments that the manager/HR professional has received in their current organisation and more detailed characteristics of the manager/HR professionals job role and reasons as to why they have volunteered to take part. The benefits of this approach are that it draws attention to any potential limitations of the implementation of the programme during rather than afterwards so aspects like delivery can be amended which may have in turn reduced

the drop-out rate (Moore et al., 2015). Process evaluation is especially important to consider when the same intervention is provided across different organisations and is therefore received in different ways (Oakley et al., 2006). As a result, some of the information provided in the programme was mostly related to office-based adjustments whereas these may not have been relevant to managers/HR professionals working elsewhere. Therefore, it is more difficult to understand why, for whom, and in which contexts the e-learning programme was both effective and ineffective (Pawson et al., 2005).

We did not measure the amount of reasonable adjustments that had been requested in each participant's own organisation as part of the study design and whether this would have changed or increased in actual adjustment decisions, as this was outside the scope, as was measuring whether the impact of the programme on knowledge and granting was long-term. Not only would this better control the effects, it would enable us to examine the near or far transfer of knowledge gained on the programme to actual behaviour using a longitudinal design (Kim & Lee, 2001). Therefore, future follow up for long term outcomes should be an essential part of measurement in future studies. Other variables that might be worth exploring would be self-efficacy or confidence relating to the granting of adjustments as these have been identified as important predictors in research related to disability and mental health training (Gayed et al., 2018; Rochette et al., 2017).

Another limitation is that there were ceiling effects observed in the ratings for legitimacy, granting, and reasonableness at Time 2 in the experimental group where all participants responded with strongly agree (Salkind, 2010). This is a limitation when examining the differences in means because it negatively skews the data which violates the assumptions and increases the risk of Type 1 error (Austin & Brunner, 2003). To reduce ceiling effects in future research, the rating scales would need to be reconsidered plus a focus on reducing social desirability effects (Deshields et al., 1995). In the present study, differences were still able to be explored through change scores although these also have lower predictive power (Jennings & Cribbie, 2016).

A final methodological limitation was the impact of time constraints on the possibility of manipulating the vignettes further. As mentioned, the study took on average one hour and a half to complete which increases the likelihood of participant fatigue, boredom, and consequently drop-out (Hoerger, 2010). These consequences are common when collecting data from a volunteer sample. If the time constraints were fewer, I would have liked to focus on manipulating the vignettes so that there were at least two vignettes per type of disability, and these were also manipulated based on actual cost. I would have also liked to add more detail regarding the employee's

strengths to see if this impacted the likelihood to grant adjustments. Better manipulation would aid the interpretation of the results to ensure that the differences in ratings are related to the type of disability rather than other factors. Future research should also build on the findings by examining the variation in type of disabilities further. Finally, future research could expand the delivery of the e-learning programme to all colleagues to investigate potential positive spill over effects on attitudes and knowledge as well as benefits to organisational culture (Schur et al., 2014).

Implications for Theory, Research, and Practice

The present study is one of the first that aims to improve managers in HR professionals understanding of ADHD and reasonable adjustments. The findings have implications for theory, research, and practice.

Theory

Theoretical models of decision-making are based on social psychology theories like social cognitive theory (SCT) and the theory of planned behaviour (TPB). The TPB posits that behaviour change interventions should target cognitions that predict intention and behaviour such as attitudes and perceived control (Ajzen, 2011). The most common method that has been investigated through research to achieve behaviour change is to provide information or persuasion (Hardeman et al., 2002). As a model, the TPB has since been criticised for neglecting the social cognitive influences on behaviour like experiences and is used in contexts where the intention to change behaviours are low (Hardeman et al., 2002). The present study challenges this limitation by including a measure of experience and applying the TBP to a context where intentions to learn are high. SCT helps explain how and why the predictors of behaviour, like attitudes, are formed. SCT acknowledges the importance of social interactions and understands knowledge to be a social construction which when challenged with new and conflicting information can provoke affective reactions and cognitive restructures of beliefs and knowledge which in turn influences behaviour (Festinger, 1957).

The findings in the present study provide support for models of behaviour change which argue that new information can change knowledge structures (Yamhill & McLean, 2001). These changes can be observed in the reduction of stereotypical explanations in the experimental group as well as the increase in knowledge scores. Therefore, by using the SCT and TPB as a theoretical lens for explaining behaviour, we are better able to influence and change behaviour so that fairer adjustment decisions are made. Theoretical models also help explain why interventions do not work for some people in some contexts and in this case have supported an explanation

as to why the granting for ADHD did not increase- due to motivation and volunteer sampling.

Therefore, the implications are that psychology theory can be successfully applied to organisational contexts and can provide an insight into the mechanisms involved in the effectiveness and ineffectiveness of diversity interventions. Future research can gain a great deal by building on these models and developing interventions that are theory-led (Paluck & Green, 2009).

Research

The main implication for research is that the study forms the first empirical work on increasing knowledge about ADHD and reasonable adjustments in a UK sample of managers and HR professionals. Throughout the thesis, the repeated finding from existing literature is that interventions for individuals with ADHD focus at the individual-level and adopt a medical perspective. Plus, there is no research that is conducted in organisational contexts. Therefore, this study adds to evidence that targeting interventions to key decision-makers can indirectly be an effective reasonable adjustment for adults with ADHD at work.

Another implication for research is that using a mixed methods approach to data collection has provided deeper insights into why the participants made the decisions they did which consequently highlighted the impact of ableist views on decision-making (Fetters et al., 2013). The majority of the research on disability interventions collects data that is either quantitative or qualitative which limits the extent to which the results can be interpreted and generalised. Therefore, the implications of using mixed methods to research is that it has the advantage of added explanation as to why there are or are not behavioural changes in intervention (Creswell., 2014).

Practice

Despite the lack of evidence supporting types of adjustments and especially exploring the efficacy of adjustments for ADHD, practice in granting adjustments is ongoing in organizations. Furthermore, organisations have taken a recent interest in increasing diversity with the advent of unconscious bias training (Atewologun et al., 2018). The implications for practice derived from the present study are firstly that the findings provide evidence of an e-learning programme aiming to increase knowledge is effective at doing so. As a result, it can be implemented as part of a wider diversity initiative rather than a stand-alone training (Chang et al., 2019). It was also well received by the participants with high scores on usability and learning. Secondly, literature suggests that diversity training should be mandatory in organisations so that it

can target employees at all levels and has shown increase efficacy in research (Bezrukova et al., 2012). Some of the findings in this study, for example those who did not complete the study were less likely to grant the ADHD adjustment at Time 1, provide support for this method of administration.

An interesting finding was that the large majority of participants were employed rather than self-employed. Thus, it is difficult to know how accessible the e-learning programme was to the self-employed. Existing research on diversity training also focuses on individuals who are employed by an organisation rather than by themselves. Although self-employment is likely to mean that a person works alone, they arguably need to know about reasonable adjustments for contact with clients. There is limited research that discusses the learning and development of the self-employed in relation to diversity training. The increased autonomy over self-development and learning indicates that the individual characteristics of the person and the organisation are likely to influence the uptake (Millsteed et al., 2017). Future research and practice should address the impact of diversity training in the self-employed and investigate how programmes can be adapted to meet the training needs of this group.

Conclusions

In conclusion, this study provides preliminary evidence to support an e-learning programme in increasing managers and HR knowledge and granting of reasonable adjustments. It achieves this by targeting those around the individual adopting a social model understanding of disability. It also highlights and builds on findings from previous chapters that the stigma surrounding hidden disabilities is present and difficult to completely eradicate. For ADHD, an e-learning intervention helped increase reasonableness and necessity but not granting of adjustments in the sample. A more holistic approach to diversity training is required to better influence behaviour.

Chapter 9 Conclusion

The present thesis aims to address the overarching question of the evidence base regarding reasonable adjustments for adults with ADHD in a work context. To fully answer the question there were three main aims based on the evidence-based management (EBMgt) framework. The first aim was to acquire and appraise the existing evidence conceptualising adult ADHD and workplace challenges as well as the documented interventions in the literature to identify any challenges related to the workplace. The second aim was to then aggregate the evidence by examining the effectiveness of the interventions on work-related outcomes and compare research to practice, by including an investigation of the practical adjustment guidance. The final aim was to apply the findings to develop and evaluate an adjustment for adults with ADHD.

Based on these aims, the thesis makes several contributions to knowledge. First, the findings indicate that there is a genuine gap in the literature for ADHD related support in the workplace and conceptualisations of ADHD that include workplace challenges. Second, the thesis contributes to this gap by providing initial evidence that interventions not directly related to the workplace can improve work-related outcomes. Third, it provides evidence to support there is a research-practice gap for ADHD related adjustments. Finally, by synthesising these findings, the thesis provides the first empirical evidence that evaluates an e-learning programme targeted at the gatekeepers who support reasonable adjustments.

Theory is developed through evidence and therefore the thesis also offers a theoretical contribution through the examination of the existing evidence. Thesis findings illustrate the underdeveloped theory in conceptualising ADHD and the interventions designed for ADHD. Furthermore, there is a distinct lack of application of theory to context, especially the workplace context. The thesis contributes to calls for organisational psychology as a discipline to apply psychological theories to examine adjustments (Colella & Bruyère, 2011). A focus on the adaptation of the environment around the employee with ADHD in the final study builds on both the social model of disability and key concepts in psychoeducation (Finkelstein, 2001; Lukens & Mcfarlane, 2004). The shift in focus and initial evidence-base advocates for support to be holistic and places importance on the social context. In addition, I identified that research pays little attention to the role of theory in understanding underlying mechanisms and effectiveness in terms of interventions associated with ADHD. The application of the social cognitive theory aids the understanding of how decisions related to reasonable adjustments are made and has supported the understandings of effective mechanisms

within interventions including the e-learning programme in the final study. Therefore, applying theories from social psychology supports understanding of why and how to better understand the workplace context advancing the theoretical knowledge on adjustments.

In accordance with the EBMgt framework, the final step is titled *assessing* and involves assessing the evidence generated to answer the overall research question. I will first revisit the aims and findings of each of the studies in the context of the overarching research question, followed by limitations and directions for future research, and concluding with the implications for theory, research, and practice. Table 9.1 summarises the key findings that are discussed in more detail.

Table 9.1*Thesis aims, EBMgt steps, chapter, and key findings*

Thesis aims	EBMgt steps	Chapter	Key findings
	Asking <i>Translating a practical issue or problem into an answerable question</i>	Chapters 1 and 2	<ul style="list-style-type: none"> • The research and theory on how best to support adults with ADHD in the workplace is limited. • There is minimal research on reasonable adjustments in the UK, especially in relation to hidden and neurodevelopmental conditions like ADHD. • A social model understanding of disability is important to address societal barriers in line with the adjustment law.
To acquire and appraise existing evidence associated with workplace challenges and support for adults with ADHD	Acquiring <i>Systematically searching for and retrieving evidence</i> and Appraising <i>Critically judging the trustworthiness and relevance of the evidence</i>	Chapter 3 and Chapter 4	<ul style="list-style-type: none"> • Lack of advancement in theories conceptualising adult ADHD, often based on child symptoms. • The majority of conceptualisations and their subsequent scales involved the core symptoms of inattention, hyperactivity and impulsivity and were developed for clinical purposes therefore adopting a medical approach. • There is limited evidence that includes interventions that involve the workplace. • Effective mechanisms of interventions for ADHD include; involving the support network around the individual, a combination of pharmacological and psychosocial with elements of psychoeducation, addressing symptoms beyond the core ones, and ensuring the interventions are long-term.
To examine the effectiveness of the existing support and compare this to the practical guidance	Aggregating <i>Weighing and pulling together the evidence</i>	Chapter 5	<ul style="list-style-type: none"> • There was a small effect of both pharmacological and psychosocial interventions identified in Study 2 on work-related outcomes. • Further research relating to outcomes associated with the workplace and in workplace contexts is required to make more concrete conclusions.

To apply the evidence-base generated to develop and evaluate an adjustment for adults with ADHD	Applying	Chapter 6	<ul style="list-style-type: none"> • In practice, evidence suggests that managers are important in the support for adults with ADHD as well as task-based strategies for challenges with organization plus, inclusive policies and procedures.
	<i>Incorporating the evidence into the decision-making process</i>	Chapter 7	<ul style="list-style-type: none"> • Attitude and knowledge are related to likelihood to grant reasonable adjustments • Empathy, necessity, and perceived cost predict reasonableness which in turn predicts likelihood to grant adjustments for ADHD • There is evidence of stereotypical judgements placed on disabilities which negatively impact decisions
		Chapter 8	<ul style="list-style-type: none"> • The e-learning programme is effective in increasing knowledge and overall granting • It is less effective for changing overall attitude and the granting of the ADHD adjustment • It provides managers/HR professionals with an understanding of why the adjustments are beneficial • The programme increased reasonableness in ADHD adjustment • The positive effect transferred to mental health conditions which saw an increase in likelihood to grant the adjustment • Stereotypical judgements reduced in the experimental group
	Assessing	Chapter 9	<ul style="list-style-type: none"> • An effective adjustment for adults with ADHD is one which adopts the social model understanding of disability and targets key gatekeepers in the adjustment process (increasing awareness and knowledge which improves decision making) • Theories from psychology can be successfully applied to explain phenomenon related to reasonable adjustments and ADHD in the workplace • Future research and practice need to focus on changing the environment, not just the individual
	<i>Evaluating the outcome of the decision taken</i>		

Asking

The introduction chapters (Chapters One and Two) highlighted a practical challenge for employers who aim to use an evidence-based approach to implement reasonable adjustments for adults with ADHD. The challenge arises from the need to provide adequate support to employees with disabilities with minimal research that outlines the effectiveness of support. Applying reasonable adjustments is a complex process which involves knowledge of a range of disabilities, navigating the legal context, and the employer's own subjectivities (Gates, 2000; Stone & Colella, 1996). For ADHD, the process is more complex because of the recency of ADHD as an adult diagnosis, the contextual constraints of receiving a diagnosis and accessing support, as well as the attached stigma (Matheson et al., 2013; Mueller et al., 2012; Waite et al., 2013). Research on ADHD is discipline specific and there is a gap in the organizational psychology literature that addresses support and adjustments (Colella & Bruyère, 2011; Gordon et al., 2015). Therefore, the overarching thesis question was to examine the evidence for an effective reasonable adjustment for adults with ADHD.

Acquiring and Appraising

For the acquiring and appraising steps in the EBMgt process the available evidence needs to be retrieved and judged based on its trustworthiness and relevance. To answer the overarching research question, the two studies outlined in Chapters Three and Four aimed to synthesise the evidence outlining the conceptualisations of adult ADHD and the interventions documented in the literature that aim to support adults with ADHD.

The rapid evidence assessment of 12 measures of adult ADHD identified that conceptualisations of adult ADHD are based on the same criteria for children and focus on the core symptoms of inattention, hyperactivity, and impulsivity. Challenges associated with the workplace were identified as poor time management, organisation, and productivity. In addition, the systematic review of 161 interventions for adult ADHD found a high prevalence of pharmacological interventions (71%) indicating that the majority of the research on adult ADHD focuses on reducing the core symptoms through medicine. Therefore, adopts a medical model of disability understanding of ADHD. More importantly, there were no interventions synthesised that involved the workplace or assessments of adult ADHD that focused on workplace challenges, emphasising the empirical gap in the literature on research that addresses ADHD in the workplace.

Adopting a realist evaluative method to the systematic review meant that the mechanisms involved in what makes the interventions effective were examined (Dalkin et al., 2015). Although the studies from the systematic review did not make the

mechanisms or underpinning theory explicit, mechanisms like psychoeducation, social cognition, and a personalised approach seemed to be more effective in not only reducing the impact of the core symptoms but improving other aspects like social and emotional functioning. Some of the psychosocial interventions also included close family or friends in the process and argued a holistic approach to support is of upmost importance.

Interventions identified focused on a medical understanding of adult ADHD which limits the applicability across contexts, in particular the workplace. The workplace is a complex context and understanding effective reasonable adjustments requires an amalgamation of legal and practical information. Therefore, even though the evidence is accepted as high in quality with the majority being randomised control trial design, it provides a one-sided view and there is little room for advancement in theory and research that can be applied across contexts (Evans, 2003).

Aggregating

The next step in the EBMgt process involves weighting and aggregating the evidence so that in the final steps the most useful evidence can be applied. To build on the findings from the first two studies, a meta-analysis was conducted on a selection of the studies identified in the systematic review ($k = 12$) to investigate the effectiveness of the interventions on work-related outcomes. Then, available evidence from a practical perspective was examined to explore whether recommendations of support available online for employees with ADHD was similar to the research findings from the systematic review.

The meta-analysis found a small effect of both pharmacological and psychosocial interventions on work-related outcomes. Converse to predictions, this effect was not different depending on the type of intervention and there were no moderator effects of length of intervention, type of control group, and type of outcome measure. Therefore, both types of intervention were successful in improving work-related outcomes indicating that any support is better than no support. The effect size was small and there needs to be further research before making any firm conclusions.

A template was derived from the findings in the systematic review and was then applied to the content from 27 websites that aimed to provide support and guidance to employees with ADHD and/or their managers. After various revisions of the template, the final template includes managers and colleagues as having key roles in supporting adults with ADHD. Work-related support then varied from individual task-based strategies like reminders to changes to the physical environment, and organisational policies and procedures. The concept of a person best fitting their job role was also argued to be an important factor in predicting wellbeing and productivity. These

findings highlight the complex nature of applying adjustments because of the varying types of adjustments and the different stakeholders involved. What was clear from these results is that there is a gap between research and practice when considering adjustments for adults with ADHD that urgently needs addressing.

Applying

For the next stage in the EBMgt process, the findings from the examination of the evidence needs to be applied to the practical challenge. A finding that is repeatedly found in the prior chapters is the limited empirical evidence on reasonable adjustments for adults with ADHD. Much of the existing literature on adjustments is based on managers and co-worker's interpretation of effectiveness rather than the employee who requested it and there has been no evidence base on adjustments specific to ADHD (Schartz et al., 2006). Therefore, the final study aimed to build on the chapters discussed thus far to provide the first empirical evidence that can contribute to the knowledge of what an effective reasonable adjustment might be for adults with ADHD. The two key findings that the final study aimed to build on was to design an intervention that adopted a social rather than medical model of disability. The second was to achieve this by targeting the intervention at the managers who are key gatekeepers in the adjustment process rather than the focus on the individual with ADHD which is in line with the premise of psychoeducation.

Data from 116 managers and HR professionals revealed that perceived necessity and cost were important predictors in the perceived reasonableness of fictitious adjustment requests. Reasonableness was the most significant and largest predictor of the likelihood to grant the adjustment indicating the impact of the subjective heuristics involved in the decision-making process. Furthermore, predictors differed according to the type of disability in the adjustment request with legitimacy being important for mental health conditions and empathy predicting reasonableness for ADHD. A thematic analysis of the reasons to grant or not grant adjustments provided insight into the decision-making process and suggested stereotypical judgements of disabilities negatively impacted the likelihood to grant the adjustment. Existing literature is yet to address the decision-making process for adjustments relate to ADHD and this study is one of the first to examine the qualitative data associated with the decision-making process.

The final study assessed the efficacy of an e-learning programme on a selection of the managers and HR professionals using a randomised control design ($n = 62$). The outcome measures were attitude, knowledge, and behaviour. Behaviour here being the likelihood of whether or not they would grant the hypothetical reasonable adjustment request. The e-learning programme consisted of explanations

about what adjustments are and how to implement them, what ADHD is and the associated workplace challenges and strengths. It also included the models of disability, the definition of neurodiversity, placed emphasis on the adjustment requesters own experience, and encouraged an evidence-based approach to selecting the right adjustment. General attitude towards employees with disabilities did not significantly change although a subscale of helpfulness towards employees with disabilities did significantly become more positive in the experimental group but not the control group. Both reasonable adjustment and ADHD knowledge significantly increased in the experimental group. With regards to behaviour, the likelihood to grant the ADHD related adjustment did not change although there was an increase in likelihood to grant the mental health condition adjustment. A closer investigation of the qualitative data indicated that the e-learning programme reduced the number of stereotypical comments associated with being less likely to grant adjustments and increased the experimental groups understanding of why the adjustment would be beneficial to the person requesting it and the organisation.

Assessing

The final stage of assessing involves evaluating the e-learning programme in the context of the original thesis question and the practical issue of practitioners having to implement adjustments associated with ADHD in organisations. Firstly, the synthesis and aggregation of existing practical and research evidence in Chapters Three-Six highlight a gap in knowledge about the most effective adjustments for ADHD. Secondly, the existing evidence base tends to adopt a medical model understanding of adult ADHD and associated support which has limited application to the workplace context. Hence, there is a need to further develop the evidence base with high quality evidence that is relevant and takes account of the social context involving theory led interventions. This evidence base can then be drawn upon by practitioners to support the decision-making process. The application of existing knowledge to an e-learning programme that targets the gatekeepers provides preliminary evidence of an adjustment that involves the environment adopting a social model understanding of disability. Existing research has studied the effectiveness of adjustments aimed at the individual not their colleagues/managers. The initial findings are promising and contribute to the development of a theory-led evidence base which is applicable to practice.

Limitations and Future Research

The limitations related to the studies in the thesis are discussed in their respective chapters. There are however some wider limitations which should be noted alongside how future research can address them.

Methodological Limitations

Measures. A common limitation throughout the thesis was the poor generalisability of the scales identified and used. These included scales that measured adult ADHD not being applicable to the workplace, outcome measures for interventions being relevant in only clinical contexts, and there being one assessment of ADHD knowledge which had poor reliability. To add, poor reliability was identified as a limitation for the reasonable adjustment knowledge scale and the perceived control items in the final study. The impact of the lack of relevance and poor reliability not only reduces the generalisability of the individual study's findings but also highlights a wider limitation in poor applicability of the scales available to researchers investigating ADHD in the workplace (Coaley, 2009b). Any research addressing evidence-based practice should also be formed from reliable and valid measures (Shaneyfelt et al., 2006). Future research should consequently aim to design a measure that can identify challenges specific to the workplace for ADHD that can be used in intervention research. It should also build on existing measures of reasonable adjustments including the knowledge scale designed in the final study and ones that have an evidence base (Doyle, 2018). Reliable and applicable measures will result in higher quality research and help further expand existing conceptualisations of adult ADHD.

Intervention Design. A notable limitation of the intervention literature was the lack of detail provided about the intervention design. Furthermore, designs tended to not be theory-led which means it is difficult to assess the underlying mechanisms involved (Pawson et al., 2005). Design is also related to the outcomes that the interventions aim to improve or reduce for example, improving memory or reducing symptoms. The outcomes should measure the mechanisms so that researchers can be clear about what is effective, in which contexts, and for whom (Porter & Halloran, 2012). Furthermore, intervention designs should be clear to the reader so that researchers can replicate findings and understand exactly how the intervention was implemented, what materials and experience were used to design it, and whether there was a protocol that was reviewed by stakeholders/expert panel.

Intersectionality. Another limitation is related to the current conceptualisations of adult ADHD and more specifically that ADHD is noted as a complex and multifaceted condition. What is neglected in the present thesis is the intersectionality of ADHD. Intersectionality is a term used to describe how there are many categories that a person can belong to, for example, ethnicity, gender, and age, and these are typically interconnected and impact power relations and the social context (Cole, 2009; Collins & Bilge, 2020). The interconnectedness of an individual's experiences is often neglected in academic research which tends to investigate one category rather than

how they relate to each other and there have been calls to use intersectionality as an analytic tool (Collins & Bilge, 2020). Researchers have shown that neurominorities are often co-occurring with ADHD highly correlated with dyslexia, autism, and mental health conditions like anxiety and depression (Germanò et al., 2012; Miller & Hinshaw, 2016; Polderman et al., 2014). Furthermore, there are theorised differences in the presentation of ADHD for example, in relation to gender, age, and race (Moody, 2016; Williamson & Johnston, 2015; Young et al., 2020). As a result, focusing on reducing ableism alone is not enough to ensure equality (Shore et al., 2011). As demonstrated in the thesis, there are elements of social power that influence the adjustment process from receiving a diagnosis to the gatekeeper's perceptions of reasonableness when granting adjustments (Florey & Harrison, 2000; Foster, 2007; Mik-Meyer, 2016). To fully address this limitation, future research will need to include adults with ADHD as key stakeholders, pay more attention to the wider social context, and examine the power structures in place. Using intersectionality as an analytic tool is also recommended (Collins & Bilge, 2020).

Individual-level Perspective. Future research should also consider examining the lived experience of adults with ADHD, specifically their work-related experiences. The importance of understanding lived experiences is vital to understand effectiveness (Sandell et al., 2013). In addition, the practical implications of an evidence-based approach are to value the individual's own view of what they think an effective adjustment would be and by including the person in the process reduces any researcher bias (Farmer & Macleod, 2011; Rios et al., 2016). Future research involving individuals with ADHD is required to fully establish what makes an effective reasonable adjustment for adults with ADHD. To achieve this, research needs to identify existing adjustments, examine their effectiveness, and measure the effectiveness of the e-learning programme evaluated in this thesis all from the perspective of individuals with ADHD.

Adjustments

The final limitations discussed are associated with the way in which adjustments have been outlined. Namely, that the adjustments identified from literature and practice as well as the adjustment of the e-learning programme predominantly focus on adjustments that are relevant to when the adult with ADHD is in employment. The research on prevalence of adult ADHD suggests that prevalence is high in prison populations and the unemployed (Küpper et al., 2012; Moore et al., 2016). There is also an indication that employees with disabilities are often underemployed too (Markel & Barclay, 2009). Therefore, when assessing the efficacy of adjustments in research and practice, there should be a focus on the selection and promotion processes within

organisations where they can better ensure candidates have a more inclusive access to work (Stone & Williams, 1997).

In addition, the type of adjustments identified in both research and practice tend to be applicable in office work environments. For instance, suggestions of an adjustment for an employee to have desk that minimises distractions is only applicable to job roles that require working at a desk. As mentioned, the e-learning programme was designed from the existing evidence base so also relied on office related adjustment examples. Future research needs to expand on the types of adjustments for a range of roles and workplace contexts.

Future Research

There are three additional directions for future research. The first is that research needs to focus on the implementation of adjustments to better understand their effectiveness (McDowell & Fossey, 2015). A process for implementing reasonable adjustments was outlined in the e-learning programme but this is yet to be examined as to whether it is transferrable to practice and is effective. Secondly, future research needs to focus on reducing the barriers to disclosure which heavily influences the adjustment process. To deepen our understanding, future research would need to further examine the stigma and stereotypes associated with ADHD and build on models of ableism. Only then, can the societal challenges begin to be removed. A third direction would be to adopt the social model understanding of disability to investigate adjustments and effectiveness.

Implications for Theory

The main thesis finding is that for conceptualisations and interventions associated with ADHD, theory is underdeveloped and needs to take account of context. This finding is in line with similar research examining the efficacy of adjustments in dyslexic employees (Doyle & McDowall, 2019). The implications are that through an application of theory that acknowledges context, researchers are better able to investigate the adjustment process and consequently the effectiveness of adjustments. The application of social psychology theories to the workplace context has been considered throughout the thesis pursuant to the ontological position of critical realism (Archer et al., 2005; Bhaskar, 2008). The application of a critical realist lens has allowed for recognition of the complexity of the social context and the mechanisms or theory that develop understanding of what works and why. For instance, the meta-analysis findings highlight that near and far transfer is an important consideration in explaining the transferability of skills developed in interventions to contexts like the workplace. The following sections explain the theoretical implications more specifically.

Conceptualising Adult ADHD

Synthesising the measures of adult ADHD in Chapter Three brought attention to the limitation of advancements in theoretical conceptualisations of adult ADHD beyond a medicalised and childhood symptom focus. The workplace challenges identified in Chapter Six build on these existing conceptualisations by providing support for the cognitive behavioural model of ADHD where social factors play an important role in the experiences of challenges. These findings highlight the importance of examining ADHD from a social cognitive perspective and the implications are that a more holistic and multidisciplinary approach to conceptualise adult ADHD is required to shed light on contexts like the workplace and the associated challenges and strengths.

Strengths associated with ADHD have been highlighted in recent research and Chapter Six but less so in intervention literature and in measures of adult ADHD. These strengths include creativity, resilience, passion, high energy, and intelligence (Sedgwick et al., 2019). There are clear implications for conceptualisations of adult ADHD to include the associated strengths to develop understanding and move away from the medicalised definition of ADHD. Including a summary of strengths related to ADHD in the e-learning programme challenged existing beliefs managers/HR professionals had about ADHD and supported them in recognising the value employees with ADHD can offer organisations when appropriately supported (Bewley & George, 2016; Chi, 2008). Therefore, conceptualisations of ADHD also need to include strengths to facilitate the development of intervention research.

Psychological Theories

The thesis has drawn on four key theories from the literature where the contribution of the evidence from the thesis has subsidised our understanding. These are: social model understanding of disability, social cognitive theory, person environment fit theory, and the stereotype content model. Ultimately, all these theories interpret the social context as vital in developing our understanding and improving outcomes for employees and employers. By adopting the social model of disability, I have arguably been able to apply an intervention that has aimed to reduce the impact of the social barriers in the environment and hence challenged the medical model. The social cognitive theory contributes to our understanding of the mechanisms behind decision-making and psychosocial interventions, including the e-learning programme. In relation to the person-environment fit theory, I have highlighted the potential misconceptions and applications of this theory to practice as well as the importance of perceived fit for the individual. The stereotype content model provided a theory-based framework for understanding the stereotypes associated with different types of disability and how these influence the decision-making process based on adjustment

requests. The SCM was extended and applied to explain stereotypes related to neurodevelopmental conditions such as ADHD and autism.

Bridging Research and Practice

Prior to discussing the separate implications for research and practice there is a need to discuss the main thesis finding which confirms that there is a gap between research and practice in relation to reasonable adjustments and ADHD. To bridge this gap there are two main implications: the need for accessible and better-quality evidence.

For research evidence to first be accessible it needs to be built from high quality research (Barends et al., 2017). In EBMgt high quality research examines effectiveness from a range of perspectives, over a long period of time, and understands the process is iterative (Briner et al., 2009). Research needs to be directly relevant to practice and transferrable meaning it should reflect practical challenges and be in enough detail that any implementation of findings is easily outlined. This research then needs to be translated into practical guidance for managers and HR professionals involved in implementing reasonable adjustments and also information for employees with disabilities who need to request reasonable adjustments.

Implications for Research

The main implication for research is that this thesis highlights the need for research to focus on adjustments for ADHD especially the mechanisms which make them effective. Therefore, research addressing the efficacy of adjustments needs to be theory driven. Wider implications include the impact of stigma on the adjustment process and the advantages of using a mixed methods approach to analysis which are outlined below.

The Impact of Stigma

The present thesis identifies stigma as playing a key role in reasonable adjustments from disclosure to the adjustment decision making process (Chaudoir & Fisher, 2010; Santuzzi et al., 2014). Therefore, the implication of this finding is that research should address and explore stigma in relation to ADHD and adopt a pragmatic approach in attempting to reduce stigma. A potential mechanism from the literature is to increase awareness about neurodiversity and the strengths employees with ADHD can offer. Furthermore, research could build on findings that a disclosure plan may be an effective method in encouraging disclosure (Gates, 2000). The findings from Chapter Seven also highlighted the stigma and stereotypes associated with autism and depression. Future research should build on these findings by investigating

how support and adjustments for these disabilities can be supported and stigma reduced.

Strengths-based Interventions

Building on the mechanism to educate about associated strengths and neurodiversity. There is evidence to suggest that adjustments or interventions that focus on strengths, like strengths-based coaching are effective for neurodivergent employees (Averns et al., 2012; CIPD, 2018; Schrevel et al., 2016). It is argued that strengths-based discussions assist in increasing self-awareness, self-efficacy, and self-esteem (Newark et al., 2016; Schrevel et al., 2016; Wood et al., 2011). They also are used to identify job roles and careers that encourage a better person-environment fit (Mao et al., 2011). Strengths can additionally be applied to interventions that involve the key gatekeepers like line managers not only to reduce stigma but to improve the quality of performance discussions and relationships with employees (Biswas-Diener et al., 2005). It is important for future research to adopt a strengths focus to develop an evidence base and support the neurodiversity movement with research (Greven et al., 2018).

Interdisciplinary and Mixed Methods Approach

The combination of theories and the variety of methods used in the thesis have demonstrated the importance of an interdisciplinary approach to understanding complex issues. Findings indicate that ADHD is mostly examined from a clinical perspective and reasonable adjustments from a rehabilitation perspective, thus the organisational psychology approach can draw together disciplines and offer alternate theories to better understand the process (Colella & Bruyère, 2011). The application of mixed methods also draws together various research and has enabled me to contribute to the understanding of the mechanisms involved in the adjustment process without which the impact of the societal misconceptions about ADHD and adjustments would not have been highlighted (Fetters et al., 2013). The implications are for research to adopt both an interdisciplinary and mixed methods approach to better understand the complex process of implementing effective reasonable adjustments.

Implications for Practice

The implications related to practice directly link to the practical issue highlighted in the research question and the introduction- employers are having to make decisions about reasonable adjustments every day in organisations and it is unclear a) how this is conducted in practice, b) what are the decisions based on, and c) how employers know which adjustments are effective for employees with ADHD.

Adjustment Process

There are implications for practice for both the gatekeepers in the adjustment process as well as the employee requesting the adjustment. Firstly, the evidence related to the decision-making process, specifically what predicts the likelihood to grant adjustments, suggests that the decision is based on a judgement of reasonableness (Telwatte et al., 2017). This judgement is formed of perceptions of necessity and cost and these are in turn related to attitudes and knowledge. Similar to research on diversity training programmes, increasing knowledge and understanding of why adjustments are required as well as counteracting the misconception that adjustments are hard to implement and expensive, assists in improving the decision-making process (Reynolds., 2010; Rochette et al., 2017). The implications of these findings to practice are related to wider diversity programmes where it is clear that more training is needed on disabilities and specifically reasonable adjustments that specifically targets these judgements.

More importantly, the thesis provides evidence that the e-learning programme can be applied successfully to a range of managers/HR professionals to increase knowledge about ADHD and reasonable adjustments. The design has received positive feedback in that it is liked and easy to navigate, it can therefore be simple to implement with reassurance that it will achieve the desired effect of increasing knowledge. Plus, organisations wanting to implement the programme can also be reassured that it is formed from an evidence base, has been demonstrated to be effective, and encourages evidence-based practice. The e-booklet can additionally be referred to by all that took part in the study and acts as practical guidance that could be distributed widely.

Findings and implications related to specific adjustments emphasise the need for a personalised approach (Schultz et al., 2011). ADHD presents differently in employees and one adjustment that is effective for one ADHDer will not necessarily be effective for all. The important step for practice here is for gatekeepers to involve the employee with ADHD in the decision-making process and be prepared for the process to be iterative. The first adjustment that is implemented may need to be changed or altered over time. Although the e-learning programme highlighted these points, transferring this learning to practice is an aspect which needs to be considered in future research.

The challenge of disclosure is highlighted in the thesis as a barrier to accessing adjustments (von Schrader et al., 2014). There is an argument that in the current process, too much responsibility is placed on the employee to disclose and the responsibility instead should be on the organisations to encourage disclosure (Foster,

2007). Challenging the stigma associated with ADHD is one way to remove the barrier of disclosure as well as encouraging a strengths-based approach to conceptualising ADHD. The e-learning programme drew attention to these issues, but it is important to note that any diversity training should be part of a wider initiative (Chang et al., 2019). In addition, training needs to adopt a more proactive rather than reactive approach in practice to reduce the barriers for adults with ADHD prior to them entering the organisation. This implication is based on the general approach to research and practice which aims to improve diversity.

In addition to disclosure, wider contextual barriers such as access to diagnostic and treatment services for adults with ADHD in the UK limit the ability to fully understand effective adjustments and highlight the need for a re-evaluation of support (Hall et al., 2013, 2015). Plus, the impact of recognition in children and quality of education so that early intervention can be achieved which minimises the experiences of negative outcomes in adulthood (Halmøy et al., 2009).

The Concept of Fit

Perceived fit between the person and the environment was identified in Chapter Six as being a potential adjustment. For example, the better fit between the employee with ADHD's strengths and their workplace environment led to more positive outcomes which has also been highlighted in the literature (Mao et al., 2011). However, there is a difference between perceived fit in relation to strengths compared to challenges. Fit was additionally mentioned in the justifications as to why HR professionals and managers would not grant an adjustment, the employees requesting the adjustments were assumed to be incapable or unsuitable for the role based on their challenges. These findings indicate a misunderstanding of the purpose of an adjustment in the person-environment relationship whereby environments are understood to be fixed and unchangeable. These findings are in line with previous examinations of managers perceptions of fit with regards to adjustments (Nishii & Bruyère, 2009). Viewing workplaces in this way leads to practical challenges and mostly impacts aspects of job analysis and granting of adjustments. Job analysis is typically the first stage in the selection process and practitioners use it to define essential tasks in the job role (Sackett et al., 2012). A consequence of job analysis is that candidates are rejected if they are not perceived to have a good fit to the organisation. The issue with job analysis is that it is subjective and based on the practitioner's perception of an ideal worker who is able bodied (Foster & Wass, 2013). Therefore, many candidates with disabilities are excluded because of how the job was designed and any adjustments are deemed unable to address the gap. Instead, practitioners should recognise their

own subjectivities when designing jobs and understand adjustments to be changes to the environment that can be achieved to address the concept of fit.

Current Context: COVID-19

As mentioned throughout this thesis, the context is an important aspect of the implications for research and practice. Yet, the context in which this thesis is situated in needs addressing. I conducted the final stages of data collection and writing up during the ongoing COVID-19 global pandemic. The unprecedented nature of the pandemic has already had an impact on organisations and society as a whole (Kaushik & Guleria, 2020). Many organisations have introduced furlough and what was perceived as low skilled jobs are in high demand (Kramer & Kramer, 2020). In addition, working from home has become the norm and many organisations have needed to introduce new policies and procedures to reflect these changes (Brynjolfsson et al., 2020). With the ever-evolving changes to the way work is designed and managed there are consequences on future research and the interpretations of this thesis' findings.

In the context of understanding adjustments, requests to adopt home working were the most common prior to the pandemic and these may change as the majority of employees have been forced to work from home (Schur et al., 2014). Prior research, and some of the qualitative data from Chapter Seven, has highlighted a reluctance from employers to encourage home working due to scepticism regarding productivity. Home working also means that employees adjustments related to communication with others may change or new adjustments need to be applied. Future research needs to examine the impact of COVID-19 on adjustments as well as the work-related wellbeing of adults with ADHD.

Final Summary

In conclusion, this thesis has critically examined the evidence for reasonable adjustments for adults with ADHD. It has argued that there are several integral aspects of adjustments that make them effective. The first is that there needs to be a holistic approach including targeting key members in the ADHDers' social network including managers and colleagues. Secondly, research is focused on the medical model understanding of ADHD and interventions typically target the core symptoms. For adjustments to be effective for ADHD they need to be applicable to workplace contexts and target challenges associated with the workplace beyond the core symptoms. Furthermore, research addressing workplace challenges and support is required for practitioners to provide adequate support. This thesis has highlighted that without evidence-based support the advice provided and lack of knowledge about ADHD is counterproductive and potentially reinforcing stigma and discrimination. Thirdly, the application of psychological theory is required to understand the effectiveness of

adjustments as well as the complexities of the adjustment process. Finally, there are social barriers that exist in relation to stigma and disclosure which can only be removed once there is an understanding of the benefits of a neurodiverse workforce as well as a revision of constraining organisational procedures and practices which limit diversity.

The e-learning programme which targets key gatekeepers in the decision-making process of granting adjustments, has preliminary support for its effectiveness in increasing knowledge and equipping managers/HR professionals with a better understanding of why adjustments are required and their subsequent benefits. Therefore, the programme targets the barriers in the social context to support reasonable adjustments extending prior research that focuses on changing the individual.

I hope this thesis acts a small but meaningful step towards a more inclusive workplace
for ADHDers.

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Appendices

Appendix 1.1

Evaluation Framework for scales assessing adult ADHD

Scale		
Title		
Author & year		
Development <i>(information from pearsonclinical.co.uk and entry on PsycTests)</i>		
Theory	Is the scale developed from a particular theory or model of ADHD?	
Items		
Standardisation	Has the scale been standardised? Is there a norm group?	
Symptoms	Which symptoms does the scale attempt to measure?	
Outcomes	Does the scale measure outcomes?	
Intervention	Is the scale related to a particular intervention?	
Delivery		
Delivery	Who is able to administer the scale?	
	Who is the recipient?	
	How long does it take to administer?	
	Is there a standardised protocol for delivery?	
Scoring	How is the assessment scored?	
Reporting	How are the results from the scale reported?	
	Is there a standardised protocol for reporting?	
Accessibility	Languages. Has the scale been translated? Does it include ambiguous language?	
Reliability		
Internal consistency	Has there been a test of internal consistency? Includes KR ₂₀ and α	

Test re-test/Equivalence	Any test-retest statistics or equivalence measures?	
Specificity/sensitivity	Are there any % biostatistics related to the diagnosis?	
Inter-rater	Has there been a test of inter-rater reliability?	
Validity		
Construct	Includes content, criterion and face validity	
Study Quality		
Quality rating	What rating are the studies associated with the scale?	
Work-related?	Do any elements of the scale or the studies associated involve work-related symptoms/outcomes?	

Appendix 1.2

Quality assessment for studies identified in rapid evidence assessment

Study Quality							
Study title							
Author (year)							
Aspect	Detail	Rating					
		N/A	0	1	2	3	4
Sample	Is the sample representative of those who will receive the scale in practice?						
	Are the selection criteria adequately explained?						
	Did the sample already have a diagnosis in adulthood?						
Method	Is there sufficient detail for the study to be replicated?						
	Did the study include a control group? (e.g. matched controls)						
	Was the method appropriate for the study's purpose?						
	Is there a potential risk of bias? (e.g. conflict of interest) R						
Total							
Study rating							

High	19-28	High quality and low risk of bias
Medium	9-18	Medium quality, unclear risk of bias
Low	0-8	Low quality and high risk of bias

Appendix 2.1

Expert panel information sheet, consent form, and interview questions

Information sheet and consent

What?

You have been invited to be a part of an expert panel for a systematic review on the support available for adults with ADHD.

Who?

The systematic review is being conducted by Kirsty Lauder, Dr Almuth McDowall and Dr Harriet Tenenbaum. Please see below for the review abstract.

Why?

As you have identified yourself as someone with an ADHD diagnosis, we would welcome your insight regarding the support for adults with ADHD in the workplace. Your input is especially helpful as you are a potential user of any effective support that may be recommended from the review findings.

How?

Firstly, we would like you to answer some questions either via email or skype/telephone/face-to-face about your opinion and experiences of ADHD and the support available. You will be sent these questions prior to the interview so you can familiarise yourself with them. You will then be asked to read the drafted review protocol question and suggest any changes. Finally, you will be asked to take part in a focus group that will review the recommendations from the review findings.

You will have the right to withdraw from the expert panel at any time prior to the data collection. You will not be identified in the final write up and we will not share your information or answers with anyone other than the members of the review team. Therefore, your responses as part of the initial expert panel will remain anonymous and confidential and on a secure database. The focus group discussion will be recorded. The transcript from the focus group will be secured in safe database and any information that may identify you will be removed from the analysis.

When?

The initial interview/email correspondence will take place in August/September and you will be asked to review the protocol question by the end of September. The recommendations will then be sent to you in November. The focus group is likely to be formed in early 2018. These timings may be subject to change.

Where?

You can take part solely through email or if you prefer the short interview can be conducted through skype/telephone or face to face. The focus group will take place at Birkbeck College or, depending on availability, via Skype.

Review abstract: A Systematic Review of the existing interventions in the literature that aim to support adults with ADHD; the method, outcomes and effectiveness.

Background

Attention Deficit (Hyperactivity) Disorder or ADHD began to be identified in the literature as a disorder that impacted the lifespan and continued to adulthood in the early 1990's. As a result, the existing research and interventions for adults with ADHD are based on studies using children and children's symptomology. Furthermore, due to a pharmaceutical focus on treatments for ADHD, limited research has been conducted into alternative interventions or support. It has been suggested that adults with ADHD are more likely to have occupational challenges such as unemployment. The systematic review will specifically review the occupational interventions available in the research for supporting adults with ADHD.

Method

A systematic review protocol identifying the reviews strategy and outlining the aims for the expert panel discussion has been developed. The following databases will be searched; EBSCO, ABI/INFORM, Web of Science and the Cochrane Library. Any studies of interventions that meet the

fore stated inclusion criteria will be included in the analysis; the criteria includes studies in the English language that clearly state the intervention, outcome and effectiveness.

Initial findings

The scoping review indicates that there are a few existing systematic reviews addressing adult ADHD. Their findings indicate that the majority are pharmaceutical and those that are non-pharmaceutical in their focus, attempt to address outcomes of co-morbid symptoms and cognition.

Consent

If you would like to take part then please reply confirming that you agree with the following:

- I have the right to withdraw from the expert panel at any time until the data analysis
- My responses will be confidential and anonymous

X

Full name
User

Interview Questions.

1. What is your definition of adult ADHD?
2. What do you think is the most accurate assessment tool for diagnosing adult ADHD, and why?
3. Which interventions that you are aware of are most effective for adults with ADHD?
4. Based on your experience, what would you recommend as 'reasonable adjustments' for an adult with ADHD in the workplace? (See UK Government definition of reasonable adjustment if unsure).
5. How effective do you think the existing psychological interventions are for an adult with ADHD?
6. What, in your opinion, are the current gaps in the adult ADHD research literature that you would like to see addressed in the next 5 years?
7. Based on the systematic review questions provided below, do you think there should be any amendments or changes?
8. Are there any research studies or interventions that you are aware of that are not published but would be useful to include in answering the review questions?

Appendix 2.2

Data extraction tool for systematic review

Data extraction tool	
Basic details	
Author	
Title	
Source	
Year, volume, pages	
Country of origin	
Full reference	
Research question and/or aims	
Study design	
Abstract	
Context	
Participant total	
Gender?	
Diagnosed (how/co-morbid)?	
Age?	
Recruitment?	1 = discharge from diagnosis 2 = recruited for diagnosis 3 = volunteer
On medication?	0 = no 1 = yes
Any other?	
Intervention location	
Intervention/treatment/programme	
Intervention type	1 = pharmaceutical 2 = non-pharmaceutical 3 = combined
Intervention aim	1 = efficacy 2 = beyond efficacy
Intervention length	1 = < 4 weeks 2 = more than 4 weeks- 6 months 3 = more than 6 months (see what defines long term in literature)
Other?	
Mechanisms	

Technique	1 = randomised 2 = non-randomised
Control group?	1 = yes 2 = no
Individual or group?	1 = individual 2 = group
Pilot study?	1 = yes 2 = no
Person/People delivering intervention	1 = medical professional 2 = researcher
People involved (family/clinician, partner etc.)	1 = yes 2 = no
Conflict of interest?	1 = potential noted 2 = potential not noted 3 = no
Outcomes	
Primary outcome	1 = symptom reduction of 'main three' 2 = cognitive functioning
Primary outcome measure	
Short term/ long term	1 = short-term 2 = long-term
Other outcomes	
Adverse effects?	1 = tested for 2 = not noted
Analysis	
Key findings	
Quant/qual	1 = quant 2 = qual
Findings in relation to review question	
Reviewers decision	
Quality rating?	
Included or excluded?	
Reason for exclusion	

Appendix 2.3

Quality assessment for systematic review¹

Study Title:				
Research				Score
1. Is there a clear statement of the aims of the research?	No/Not sure (0)	Yes (1)		
2. Is the research methodology appropriate for addressing research question?	No/Not sure (0)	Yes (1)		
3. Have ethical issues been considered and stated?	No/Not sure (0)	Yes (1)		
4. Does the data sufficiently support the findings?	No/Not sure (0)	Yes (1)		
5. Is there a clear statement of findings?	No/Not sure (0)	Yes (1)		
6. Are the recommendations practical?	No/Not sure (0)	Yes (1)		
7. Are potential conflicts of interest/bias explored or discussed?	No mention (0)	Little mention (1)	fully explored (2)	
Context				
8. Participants generalizable to the intervention?	No/Not Sure (0)	Yes (1)		
9. Participants blind to intervention rationale?	No (0)	Partly (1)	Yes-completely (2)	
10. Was the recruitment strategy appropriate to the aims of the research?	No/Not sure (0)	Yes (1)		
Intervention				
11. Control group	No control (0)	control group (1)		
12. Control group type	No control (0)	disorder (1)	waiting list (2)	
Mechanisms				
13. Any methodological controls within the study?	None (0)	Control (1)		

¹ Adapted from: *Newcastle-Ottawa Quality Assessment Scale and Cochrane Collaboration's tool for assessing risk of bias (adapted from Higgins and Altman) and the Qualitative Research Checklist from the Critical Appraisal skills programme*

Outcomes				
14. Were participants blind to the outcome assessment?	No (0)	Partly (1)	Completely (2)	
15. Assessment of main outcome:	Observation (0)	self-report/interview (1)	Physiological/neurological/task based (2)	
16. Length of follow up:	less than a month (0)	1-6 months (1)	6 months or more (2)	
17. Assessment of outcome prior to intervention:	no assessment prior (0)	same assessment (1)		
18. Did the outcomes go beyond core ADHD symptoms?	No (0)	Yes (1)		
Total:				

Score /24	Risk of bias	Interpretation	Across trials
0-8	Low risk of bias	Bias, if present, is unlikely to alter the results seriously	Most information is from trials at low risk of bias
9-16	Unclear risk of bias	A risk of bias that raises some doubt about the results	Most information is from trials at low or unclear risk of bias
17-24	High risk of bias	Bias may alter the results seriously	The proportion of information from trials at high risk of bias is sufficient to affect the interpretation of results

Appendix 4.1

List of included websites

1	https://www.lochassociates.co.uk/adult-adhd-managing-performance/
2	https://www.webmd.com/add-adhd/adhd-in-the-workplace
3	https://pmjobs.cipd.co.uk/article/career-masterclass-how-to-manage-adhd-in-the-workplace/
4	http://www.lanc.org.uk/wp-content/uploads/2011/08/Adult-ADHD-in-the-Workplace.pdf
5	https://adhdwork.add.org/accommodations-for-adhd/
6	https://gbr.pepperdine.edu/2010/08/attention-deficit-hyperactivity-disorder-adhd-in-the-workplace/
7	https://www.lawscot.org.uk/members/journal/issues/vol-62-issue-09/adult-adhd-a-performance-management-issue/
8	https://www.scotsman.com/news/opinion/columnists/pam-loch-adult-adhd-symptoms-need-careful-handling-1446535
9	https://www.psycom.net/adhd-in-the-workplace/
10	https://www.everydayhealth.com/add-adhd/tips-for-working-with-adult-adhd.aspx
11	https://demos.co.uk/press-release/new-research-finds-undiagnosed-adult-adhd-could-cost-billions-every-year/
12	https://www.socialworktoday.com/archive/052010p14.shtml
13	https://caddac.ca/adhd/document/workplace-accommodations-and-strategies/?doing_wp_cron=1600687568.7673449516296386718750
14	https://psychcentral.com/lib/adhd-in-the-workplace-solutions-and-success/
15	http://www.sadag.org/index.php?option=com_content&view=article&id=2398:adult-...Adult%20ADHD%20in%20the%20Workplace
16	http://workplacementalhealth.org/Mental-Health-Topics/ADHD-Adults

17	https://www.mindtools.com/pages/article/managing-adhd.htm
18	https://www.careercast.com/adult-adhd-career-success
19	https://www.helpguide.org/articles/add-adhd/managing-adult-adhd-attention-deficit-disorder.htm
20	https://www.canopyhealth.com/en/employers/articles/adult-adhd-and-work-performance.html
21	http://www.sparkproductivity.com/adhd-workplace
22	https://www.posturite.co.uk/blog/sit-stand-desks-workplace-game-changers-adhd-adults
23	https://adhdsupporttalk.com/2017/05/08/disorganization-at-work-with-adult-add-adhd/
24	https://www.healthyplace.com/adhd/articles/job-accommodations-for-adults-with-adhd
25	https://www.coulditbeadhd.ca/tips-employees-adult-adhdADHD
26	https://www.youtube.com/watch?v=6Y1Sd8TbbuE
27	https://www.pinterest.com.au/pin/131800726580253756/

Appendix 4.2

Final template

Advice and support

1. External/interpersonal resources
 - a. Managers role
 - i. Reminders
 - ii. Structure
 - iii. Mentorship
 - iv. Feedback
 - v. Knowledge
 - vi. Recommendation to medical professional
 - vii. Seek diagnosis
 - viii. Create creative roles
 - ix. Situational leadership
 - b. Coach/mentor
 - i. Deal with emotions
 - ii. Identify and work to strengths
 - c. Colleague/'buddy'
 - i. Provide structure
 - ii. Reminders
 - iii. Disability awareness training
2. Task-related strategies
 - a. Reward based systems
 - i. Short term
 - ii. Smaller goals
 - iii. Tracking progress
 - b. Memory techniques
 - i. Memory training
 - ii. Technology
 - iii. Record meetings
 - iv. Written instructions
 - v. reminders
 - c. Organisation
 - i. Colour coding
 - ii. Break tasks down
 - iii. Tracking progress
 - iv. Note taking
 - v. Avoid procrastination
 - d. Time-management

- i. Calendars
 - ii. Planners
 - iii. Bullet journal
 - iv. Timers
- 3. Alterations to physical environment
 - a. Workspace
 - i. Close office door
 - ii. Quiet space
 - iii. Own desk
 - iv. Space away from others
 - v. Standing desk
 - b. Tools
 - i. Desk organisers
 - ii. Noise cancelling headphones
- 4. Structure, job design, organisational policy and procedures
 - a. Policy
 - i. Flexible working
 - ii. Job sharing
 - iii. Working from home
 - iv. Part-time work
 - b. Procedures
 - i. Working when others aren't there
 - ii. Project sharing
 - iii. Movement breaks
 - iv. Short-term projects
 - v. Emotional breaks
 - c. Job crafting
- 5. The 'right' career
 - a. Role
 - i. Creativity
 - ii. Fast-paced
 - iii. Strengths/interests
 - b. Employment-type
 - i. Self-employment
- 6. Lifestyle
 - a. Relaxation
 - b. Exercise
 - c. Diet

Strengths and challenges

1. Cognition
 - a. Challenges
 - i. Inattention
 - ii. Focus
 - iii. Working memory/forgetfulness
 - iv. Concentration
 - v. Mind wandering
 - b. Strengths
 - i. Imagination
 - ii. Innovation
 - iii. Risk taking
 - iv. Creativity
 - v. Problem solving
 - vi. Thinking outside the box
 - vii. Hyper focus
 - viii. Intelligence
2. Movement
 - a. Challenges
 - i. Fidgeting
 - ii. Restlessness
 - b. Strengths
 - i. High energy
 - ii. Enthusiasm
 - iii. Work ethic
3. Task-related
 - a. Challenges
 - i. Procrastination
 - ii. Productivity
 - iii. Performance
 - iv. Organisation
 - v. Time-management
 - vi. Distraction
 - vii. Transitions
 - viii. Following direction
 - ix. Paperwork
 - x. Planning
 - xi. Lateness
 - xii. Missing deadlines
 - xiii. Overcommitment
 - xiv. Mistakes/accidents
 - xv. Boredom
 - xvi. Finishing projects
 - xvii. Noisy offices
 - xviii. Working overtime
 - b. Strengths
 - i. The right job
 - ii. Multitasking
 - iii. Persistence
 - iv. Productivity
 - v. Willingness to learn
4. Interpersonal
 - a. Challenges
 - i. Turn taking
 - ii. Interruptions
 - iii. Arguments
 - b. Strengths
 - i. Fun

- ii. Charm
 - iii. Compassion
 - iv. Generosity
 - v. Humour
5. Intrapersonal
- a. Challenges
 - i. Emotional regulation
 - ii. Low self-esteem
 - b. Strengths
 - i. Resilience

Appendix 5.1

Information and consent form for reasonable adjustment knowledge scale validation

Thank you for your interest in taking part in this study. Before you decide to take part, it is important for you to understand why the research is being done and what the study will involve. Please take time to read the following information carefully and if you have any questions, please do not hesitate to contact the researcher using the details at the bottom of the page.

Purpose

The aim of the study is to see how much people know about reasonable adjustments.

Who is eligible to take part?

You must meet the following criteria to participate in the study:

Over the age of 18 and have lived in the United Kingdom for 5 years or more.

What do you have to do?

You will be asked to complete an online survey that takes approximately 15-20 minutes to complete. In this survey you will be asked about your knowledge of reasonable adjustments. You will then be asked to provide some demographic information.

What's in it for me?

You will be paid via the Prolific Academic platform so long as you pass the attention checks in the study.

Do I have to take part?

Participation is voluntary and you have the right to withdraw at any time, without reason, during the study. You must use your Prolific Academic ID to withdraw your data. Once the data has been analysed you will no longer be able to withdraw your data because it will have been anonymised.

Confidentiality

All data will be kept strictly confidential and only the researcher and two supervisors will have access to the data. Data will be stored on a secure computer with password protection. No personal details for example; names will be kept. Your prolific academic ID will not be deleted prior to data analysis.

What will happen to the analysed data?

The results of the research will be anonymised and analysed as part of the researcher's doctorate thesis. Results may be presented at conferences and submitted to journals for publication. Data will only be presented at the aggregate level. We may also upload the anonymised data for other researchers to use.

Ethics?

The study has received ethical approval from Birkbeck College (ethics approval number: OPEA-18/19-06).

Contact details:

If you have any questions about the study prior to taking part, please use the contact details below.

Researcher: Kirsty Lauder, Birkbeck College, Organisational Psychology, [REDACTED]

If you have any ethical concerns or concerns about the research in general, please contact the supervisor: Prof Almuth McDowall, [REDACTED]

For information about Birkbeck's data protection policy please visit: <http://www.bbk.ac.uk/about-us/policies/privacy#7>

If you have concerns about this study, please contact the School's Ethics Officer at:

BEI-ethics@bbk.ac.uk.

School Ethics Officer, School of Business, Economics and Informatics, Birkbeck, University of London, London, WC1E 7HX

You also have the right to submit a complaint to the Information Commissioner's Office

<https://ico.org.uk/>

Consent

If you would like to take part in this study, please check that you agree with the following statements:

- I confirm that I have read and understood the information above.
- I have had the opportunity to ask questions and had them answered.
- I understand that all personal information will remain confidential and that all efforts will be made to ensure I cannot be identified.
- I agree that data gathered in this study will be stored anonymously and securely, once data collection is complete. Prior to the completion, I understand my data will be stored securely on a password locked device.
- I understand that my participation is voluntary and that I am free to withdraw at any time up until the data has been collected and anonymised.
- I confirm I meet the eligibility criteria stated above.
- I agree to take part in this study.

Appendix 5.2

Reasonable adjustment knowledge scale items

1. An example of an auxiliary aid adjustment is text-to-speech software.
2. An example of a policy-level adjustment is allowing for flexible working.
3. Employers can deny a job to a qualified individual with a disability because they require reasonable adjustments.
4. An employer can choose not to hire someone with a mental health condition because they consider that the job demands are excessive.
5. The disabled employee pays for any reasonable adjustments they require.
6. Employers can ask candidates which reasonable adjustments may be required to complete essential job tasks.
7. Once a reasonable adjustment has been implemented, it cannot be changed.
8. Implementing reasonable adjustments is an iterative process.
9. Reasonable adjustments are adaptations the employee must make.
10. An example of a physical feature adjustment is providing a support assistant for reading.

Appendix 5.3

e-learning study pilot information sheet and consent form

Thank you for agreeing to pilot my e-learning programme and corresponding surveys and vignettes.

I will be adopting the think-aloud protocol technique which means that everything you think you will need to verbalise as you go through the material. For example, if you were looking for the right button to press you would say "I am looking for the right button to press". I will take notes during this session but will not record you.

You can withdraw at any time, without reason, by letting me know. Your responses will remain anonymous and my notes (based on your responses) will be shared with my two supervisors. If you would like, you can request my notes afterwards to check for accuracy.

To pilot the intervention, I will first provide a description of the study and the rationale. We will then review 14 vignettes and you will select 8 that you think are of a better standard. We will then go through the initial survey and continue through the e-learning intervention and finish with the survey at the end. If you have questions during the pilot, please ask them as soon as they come to mind, and I will answer them the best I can.

Based on this information, please sign the consent form below to confirm that you have read the information above and are happy to proceed.

Signature: _____ Print Name: _____

Appendix 5.4

e-learning study information sheet and consent form

Neurodiversity in the workplace- a free e-learning training programme.

Thank you for your interest in taking part in this study. Before you decide to take part in the study, it is important for you to understand why the research is being done and what the study will involve. Please take time to read the following information carefully and if you have any questions, please do not hesitate to contact the researcher using the details at the bottom of the sheet.

Purpose

The aim of the study is to explore the effectiveness of an e-learning programme that teaches about reasonable adjustments and neurodiversity in the workplace.

Who is eligible to take part?

You must be all of the following to participate in the study:

- Over the age of 18 and work in the UK
- In full-time or part-time employment
- A line manager or HR professional who has been in this role for 18+ months

What do you have to do?

You will need to send an email to the researcher confirming your interest in taking part. The study lasts 4-6 weeks and you must be contactable via email during this time. Prior to the e-learning programme you will be asked to complete a brief questionnaire about reasonable adjustments and rate some scenarios. The e-learning programme will require you to complete 5 topics each lasting 30 minutes. You have 2-3 weeks to complete these 5 topics and can do them in your own time. Each topic will give you information using PowerPoint slides and helpful documents. You will then be quizzed on your knowledge after each topic before progressing to the next one. After you have completed the e-learning programme you will be asked to complete a final questionnaire about reasonable adjustments.

What's in it for me?

At the end of the e-learning programme all participants will receive an e-booklet outlining the information learnt over the course.

Do I have to take part?

Participation in the whole study is voluntary and you have the right to withdraw at any time, without reason, during the study. You must use your unique code to withdraw your data. Once the data has been analysed you will no longer be able to withdraw your data because it will have been anonymised. Email addresses will also be deleted at the point of data analysis.

Confidentiality

All data will be kept strictly confidential and only the researcher and two supervisors will have access to the data. Data will be stored on a secure computer with password protection. No personal details for example; names will be kept. The only information that will be collected are email addresses and these will be stored separately from the data. Your unique username will be used to identify your data.

What will happen to the analysed data?

The results of the research will be anonymised and analysed as part of the researcher's doctorate thesis. Results may be presented at conferences and submitted to journals for publication. Data will only be presented at the aggregate level. We may also upload the anonymised data for other researchers to use.

You are welcome to enter your email address at the end of the study to request a copy of the write-up.

Ethics?

The study has received ethical approval.

Contact details:

If you would like to take part in this study, please email a signed consent form (below) to the researcher. Also, if you have any questions about the study prior to taking part please use the same contact details.

Researcher: Kirsty Lauder, Birkbeck College, Organisational Psychology

████████████████████

If you have any ethical concerns or concerns about the research in general, please contact the supervisor: Prof Almuth McDowall,

████████████████████

For information about Birkbeck's data protection policy please visit: <http://www.bbk.ac.uk/about-us/policies/privacy#7>

If you have concerns about this study, please contact the School's Ethics Officer at:

BEI-ethics@bbk.ac.uk.

School Ethics Officer
School of Business, Economics and Informatics
Birkbeck, University of London
London WC1E 7HX

You also have the right to submit a complaint to the Information Commissioner's Office

<https://ico.org.uk/>

Consent to take part: Neurodiversity in the workplace- a free e-learning programme.

- I confirm that I have read and understand the Information Sheet above.
- I have had the opportunity to ask questions and had them answered.
- I understand that all personal information will remain confidential and that all efforts will be made to ensure I cannot be identified.
- I agree that data gathered in this study will be stored anonymously and securely, once data collection is complete. Prior to the completion, I understand my data will be stored securely on a password locked device.
- I understand that my participation is voluntary and that I am free to withdraw at any time up until the data has been collected and anonymised.
- I confirm I meet the eligibility criteria stated above.
- I agree to take part in this study.

Signature:

Date:

Email address:

Appendix 5.5**Items and vignettes**

Attitude- productivity perceptions and helpfulness towards disabled workers (Scherbaum et al., 2005)

1. Employees with disabilities can hold supervisory positions.
2. Employees with disabilities increase the workload of their co-workers.
3. Employees with disabilities can improve the atmosphere of the workplace.
4. Employees with disabilities need constant help to perform common work tasks.
5. Employees with disabilities can work on hazardous jobs.
6. Employees with disabilities require more supervision than non-disabled employees.

7. Employees with disabilities slow down the rate at which work is completed.
8. I would socialise with a co-worker who was disabled during my work breaks.
9. I would share my workspace or desk with a co-worker who was disabled.
10. I would assist a new co-worker who was disabled in learning his or her new job.
11. I would take on more work to assist a co-worker who was disabled.
12. I would avoid working in a group with a co-worker who was disabled.
13. I would accept a job that would require me to work closely with co-workers who are disabled.
14. I would change the way I do my job to make it easier for a co-worker who was disabled to do their job.

ADHD Knowledge (Bramham et al., 2009)

1. ADHD is a disorder present from childhood.
2. ADHD is contagious.
3. People with ADHD find it difficult to follow rules.
4. ADHD symptoms can be treated with medication.
5. People with ADHD can never fulfil their potential.
6. People with ADHD are distractible.
7. People with ADHD have difficulties concentrating.
8. People “grow out” of ADHD but the rate varies from person to person.
9. People with ADHD are less intelligent than the normal population.
10. Whether you have ADHD depends on how you were brought up.
11. More females than males have ADHD.
12. People with ADHD prefer short-term rewards over long-term rewards.
13. People with ADHD have difficulties with self-restraint.
14. ADHD is a lifelong condition.
15. People with ADHD become bored more easily than other people.
16. People with ADHD are likely to have additional psychological problems.
17. People with ADHD rarely get tired.
18. ADHD is a problem of motivation.
19. People with ADHD find it difficult to organize themselves.
20. People with ADHD are slow to understand instructions.

Perceived control

1. For me to grant a reasonable adjustment for an employee with a disability is...
2. I am confident that I have the skills to grant a reasonable adjustment for an employee with a disability.
3. It is mostly up to me whether or not my organisation grants reasonable adjustments.

Vignettes

Time 1

1. You are working with Harper, a marketing assistant, whose role is to compile and distribute budget spreadsheets, analyse questionnaires, write reports, assist with promotional activities and visit customers. They have recently been diagnosed with depression and experiences mild insomnia, occasional fatigue, and reduced energy. They requested that they can work from home two days per week and adopt flexible working hours. They have also requested a self-paced workload to assist with symptoms.
2. You are working with Lee, an administrative assistant, whose role is to organise and schedule appointments, develop and maintain a filing system and provide general office support. They have a spinal cord injury and use a wheelchair to move around. They requested that adaptations be made to their desk to allow for wheelchair access and support travelling to and from work. They also requested regular breaks.
3. You are working with Daryl, a receptionist, whose role is to welcome visitors, answer inquiries, give instructions and follow procedures. They were recently diagnosed with autism and experience difficulties concentrating, understanding social cues and are sensitive to light. They have requested dimmed lighting for their workspace, frequent meetings with their line manager and regular breaks.
4. You are working with Tobie, a social media assistant, whose responsibility is to manage the company's social media channels and assist with larger projects where social media management is required. They have recently been diagnosed with attention deficit hyperactivity disorder and experience difficulties concentrating, challenges with meeting deadlines and feelings of restlessness. They have requested frequent meetings with their line manager to keep to deadlines, regular breaks and a workspace that minimalizes distractions.

Time 2

5. You are working with Charlie, an executive assistant, whose role is to support senior management with organising, scheduling, correspondence and office management. They have a mild visual impairment, and this impacts all aspects of their job role. They requested screen reading software and a large desktop monitor. They additionally requested frequent breaks from the screen.
6. You are working with Sam, an HR assistant, whose role is to be involved with the recruitment, hire and training of employees in your company. General tasks include posting job opportunities, collating information on new applicants and informing employees of their hiring status. They have recently been diagnosed with obsessive-compulsive disorder, and experience difficulties with getting to work on time, occasional challenges with concentrating on work tasks and anxiety whilst travelling to work on public transport. They have requested

flexible working hours, a quiet space to de-stress before beginning work and more frequent breaks.

7. You are working with Morgan, a customer service assistant, whose role is to answer and support customers with their queries, referring them to the correct department if necessary, providing information and selling products. They have recently been diagnosed with attention deficit hyperactivity disorder and experience challenges with time management, organisation and being easily distracted. They have requested to adopt flexible working, have a noise-cancelling headset and all instructions in writing.
8. You are working with Frankie, a learning and development assistant, whose role is to provide support to the learning and development team by answering queries, maintaining records, selecting materials and assisting in launching initiatives. They were recently diagnosed with autism and experience difficulties with social interactions, time management and are sensitive to sound. They requested regular planning meetings, a noise-cancelling headset and a job coach.

Vignette items

1. I can empathise with this employee's concerns.
2. Irrespective of the adjustment, I believe this specific disability to be a legitimate disability.
3. This specific adjustment is necessary for organizational productivity.
4. What cost would you associate with this specific work adjustment?
5. How reasonable do you believe this work adjustment is?
6. How likely are you grant this specific work adjustment request?
7. Please list reasons for your answer to question 6. Your advice and experience is really important to help us understand your decisions in context.

e-learning feedback

1. The e-learning programme was easy to navigate.
2. The content of the programme was helpful.
3. I did not enjoy the e-learning programme.
4. I felt engaged whilst learning.
5. The e-learning programme could have been longer.
6. I was confident using the e-learning programme.
7. The e-learning programme would not work in my organisation.
8. I learnt a lot from the e-learning programme.
9. There was not enough content in the e-learning programme.
10. I intend on implementing what I have learnt from the e-learning programme in my organisation.

Appendix 5.6

Final Time 1 template for qualitative justifications of likelihood to grant adjustments

1. Reasons to grant adjustments
 - a. Benefits individual
 - i. Well-being
 - ii. Ability to do job
 - iii. Satisfaction
 - iv. Symptom reduction
 - v. Work-life balance
 - b. Benefits organisation
 - i. Increased productivity
 - ii. Increased performance
 - iii. Positive company image
 - c. Personal experience
 - i. Self
 - ii. Family member
 - iii. colleague
2. Reasons to not grant adjustment
 - a. Suitability for the role
 - i. Alternate role
 - b. Need for professional advice
 - i. GP
 - ii. Occupational health
 - c. Delegitimising condition
 - i. Onset
 - ii. Disability definition
 - d. Negative impact on the team
 - i. Increased workload
 - ii. Special treatment
 - e. Negative impact on the manager
 - i. Increased workload
 - f. Negative impact on organisation
 - i. Expensive
 - ii. Difficult to implement
 - g. Perceived incompetence
 - i. Taking advantage
 - ii. Lower productivity
 - iii. Require extra management
 - iv. Requires performance review

Appendix 6.1

Final Time 2 template for qualitative justifications of likelihood to grant adjustments

1. Reasons to grant adjustments
 - a. Benefits individual
 - i. Well-being
 - ii. Ability to do job
 - iii. Satisfaction
 - iv. Symptom reduction
 - v. Work-life balance
 - b. Benefits organisation
 - i. Increased productivity
 - ii. Increased performance
 - iii. Positive company image
 - c. Personal experience
 - i. Self
 - ii. Family member
 - iii. Colleague
 - d. Reasonable
 - e. Low cost and easy to implement
 - i. Low cost
 - ii. Easy to implement
2. Reasons to not grant adjustment
 - a. Suitability for the role
 - i. Alternate role
 - b. Need for professional advice
 - i. Occupational health
 - c. Negative impact on the team
 - i. Increased workload
 - ii. Special treatment
 - d. Negative impact on the manager
 - i. Increased workload
 - e. Negative impact on organisation
 - i. Expensive
 - ii. Difficult to implement
 - f. Perceived incompetence
 - i. Taking advantage
 - ii. Lower productivity
 - iii. Require extra management
 - iv. Requires performance review