

A Literature Review on High-functioning Autistic Employees

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Abstract

This literature review aims to contribute to the field of autism and employment. It will analyse bibliographic data on peer-reviewed research on the benefits and challenges of a neurodiverse workforce. Similarly, it will examine the experiences of high-functioning autistic people in the workplace. Despite reports in popular media on the benefits of a neurodiverse workplace, including better innovation and company performance – there is very little academic research to support these claims. Of the limited existing literature, there are very few articles in business and management journals. This review gathers empirical evidence to test such claims. The research is based on high-functioning autistic people (verbal, with average or above IQ). Autism will be referred to as Autism Spectrum Disorder (ASD) from here on, which includes Asperger syndrome under the criteria of the DSM-5.

Data from peer-reviewed research articles on high-functioning autism, employment and adults in the Social Sciences Citation Index were analysed to gauge the current trends in publication and citation. This database was chosen to limit the medical literature, which is extensive and an entirely different field. The data indicates that research on the experiences autistic employees, and their employers, up to recent years has been an understudied field. Based on the analysis used for this study, research and interest in this field began to emerge in publications in 2005. This review identified high-functioning autism as an increasingly important factor to consider in designing hiring and recruitment processes. It is also a significant consideration in conflict-resolution, communication and the training and support areas of management. Considering the steep increase in autism diagnoses over the past 30 years, coupled with the supports made available to autistic people up to third-level education; a more neurodivergent, educated talent pool is emerging which will change the way managers approach and manage diversity in the workplace.

Introduction

This review aims to contribute to the body of research on autism and employment by collecting, presenting and analysing bibliometric data on peer-reviewed journal articles in the field, identifying gaps and limitations for further study. Despite the growing media attention on the benefits of hiring autistic employees, there has been little academic research to back up these claims. The Harvard Business Review for example, featured an article on neurodiversity as a competitive advantage claiming that many people with neurological conditions such as autism (ASD), dyslexia and dyspraxia are particularly skilled in pattern recognition, mathematics and memory referring to this group as a reserve of untapped talent (Austin and Pisano, 2017).

Excerpts from blogs and Steve Silberman's book *Neurotribes* (2015) were referred to throughout the article. So too were steps to create a more neurodiverse workplace as set out by Specialisterne (a not-for-profit foundation that assesses, trains and manages autistic talent in software engineering). Examples of neurodiversity programmes in businesses such as HPE and SAP were also included. Yet no empirical evidence was provided to support the case that neurodiversity benefits employers. The only support lent to the argument was that "preliminary results suggest that the organisation's [HPE] neurodiverse testing teams are 30 per cent more productive than the others" (p. 99). No further data on these results was provided.

Similarly, the BBC business news website Capital, featured an article on why autistic employees are the best workers around (Alsop, 2016). In it, a director of Towers Watson said the company actively recruits autistic people because they are "loyal and diligent and are a lower turnover risk." Other benefits such as "the ability to concentrate on long, repetitive tasks, retention of large amounts of information, a knack for detecting patterns, or strong mathematics and coding skills" were also listed, with SAP's head of diversity Anka Wittenberg quoted as saying, "we find them good for software testing and quality assurance; they can concentrate a long time on a repetitive task and spot mistakes better." Although there are some studies that suggest autistic people are skilled in visual and technical tasks (Baldwin et al., 2014), there is no conclusive evidence to confirm this. Similarly, while some autistic people are described as possessing skills such "honesty, efficiency, precision, consistency, low absenteeism and a disinterest in 'office politics'," (Baldwin et al., 2014, p. 2440, Richards, 2012); this can be true of many people who are not autistic. The evidence in these reports is largely anecdotal.

What is striking about the claims that autistic people possess such talents for employment, is the research that shows they have the lowest employment rates of all disability groups (Roux et al., 2013; Shattuck et al., 2015). These findings show that young autistic adults are the most unemployed group when compared with their peers with learning disability, intellectual disability and speech/language impairment. However, it is important to note that other authors argue that people with sensory disabilities (vision/hearing) have poorer outcomes than those with other disabilities (Bainbridge and Fujimoto, 2018). Even so, if high-functioning autistic employees

have a lot to bring to any business, as suggested in the media, why are they out of work? Similarly, apart from the benefits from a societal perspective and the limited evidence that governments can save in the long-term, by offering supported employment programmes for autistic adults (Hedley et al., 2017) – what do employers gain from neurodiversity? Why bother creating neurodiversity programmes at all?

One of the few studies ever published on employers' perceptions of the costs and benefits of hiring autistic people in open employment by Scott et al. (2017) suggested that employing an autistic adult provided benefits to employers. These included the autistic employees displaying: above-standard workplace performance, increased attention to detail, quality of work and work ethic when compared to their colleagues. The study also found that while hiring an autistic employee may require some modifications in the workplace, supervision and training – there was no significant difference between autistic employees and their colleagues regarding the costs associated with weekly employment, supervision and training. Like this review, this one featured high functioning autistic people, without an intellectual disability, acknowledging that ASD is a spectrum disorder and that the research does not represent all autistic people. While the emphasis of Scott et al.'s (2017) study was on the costs and benefits of hiring an autistic person to the employer, a minority of the researchers were from a business and management discipline; it was largely from an occupational therapy/education perspective. Therefore, a somewhat crude measurement of costs was included, but details on the performance of the autistic employees or broader benefits to the company were excluded.

The aim of this study is to conduct a literature review using academic articles and books from the discipline of business. The review will identify the consequences of hiring autistic people, both positive and negative from the employer's perspective, an autistic person's perspective, via a social science, rather than medical, model. Specifically, this is from a business and management discipline.

Since 2013, Asperger syndrome is no longer a stand-alone diagnosis, but falls under the broader ASD diagnosis. As such, Richards (2012) research population would come under the high-functioning ASD population this review is focused on. However, this population excludes those with high-functioning autism who would not have been diagnosed with Asperger syndrome before 2013; both groups are covered in this review. Richards writes, "the topic of Asperger syndrome and employment has yet to permeate the academic literature on human resource management, employment relations and organisation studies" (p. 630). This review aims to add to this literature. As diagnoses of autism have significantly increased over the past 30 years, with more and more autistic people graduating from third-level education thanks to access programmes, there is a need for more research into autism and employment, to change the current trends of up to 80 per cent unemployment (Barnard et al., 2001), by examining in more detail the benefits of hiring autistic people (Hensel, 2017). Similarly, there is a gap in research where the narrative of

autistic people is used to illustrate their personal experience of employment (Morgan et al., 2014; Krieger et al., 2012), the vast majority of research is descriptive.

This review will:

1. Contextualise the review by providing a background on the current state of research in this field.
2. Provide a brief history of ASD and discuss how the understanding of the disorder has changed over the past 60 years.
3. Chronicle the rise of the neurodiversity movement
4. Discuss the current trends in autism and employment research and highlight the need for further study on supports to accommodate the growing number of autistic individuals who, with the right support, are fit for employment.
5. Identify reasonable accommodations and further explore the benefits of neurodiversity programmes to business.

Background

The Diagnostic and Statistical Manual of Mental Disorders (DSM), edited by the American Psychiatric Association, is one of the standard classification guides of mental disorders with associated criteria to facilitate diagnoses, used by mental health professionals worldwide. Other such guides include the International Classification of Diseases (ICD), and the International Classification of Functioning, Disability and Health (ICF). The DSM-5, as its name suggests, is the fifth edition of the manual. This version removed Autistic Disorder, Asperger's Disorder (AS), Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS) and Childhood Disintegration Disorder as stand-alone diagnoses and creating a new catch-all Autism Spectrum Disorder (Lai et al., 2013). The DSM-5 was published in 2013 and though there has been concern about over-diagnosis and the creation of a number of new disorders (Frances, 2010), there is evidence that the new criteria for diagnosing ASD has reduced false positives; albeit with a caution for reducing sensitivity among older children and adolescents, including those that would have been diagnosed with AS or PDD NOS using the DSM-IV (Lai et al., 2013; Maenner et al., 2014). Similarly, despite the removal of AS as an official diagnosis, the term (Asperger's or Asperger syndrome) remains commonly used, along with the terms low and high-functioning autism, to describe those functioning on the lower or higher end of the spectrum. The latter includes those with an average or above average cognitive ability; who are verbal, capable of working and living independently (Hensel, 2017).

What is Autism?

Autism is generally regarded as a neurodevelopmental disorder, the main characteristics of which involve deficits in social interaction and social communication, and repetitive, or restrictive patterns of behaviour and interests (Crespi, 2016). It was first proposed as a spectrum disorder by psychiatrist Lorna Wing some 40 years ago (1975), to illustrate the heterogeneity of the symptoms (as described above) and their effect on the life of the autistic person. No two autistic people present with identical portfolios and from outward appearances it is often impossible to tell that someone has high-functioning autism (Richards, 2012). The DSM-5 incorporates the severity of symptoms in its diagnostic guidelines to outline the necessary supports required as part of the diagnostic process, but not to diagnose someone as a high or low functioning autistic. While these terms are commonly used to describe the severity of symptoms, they are not attached to the diagnosis; ASD as a standalone condition.

ASD affects approximately 1 per cent of the population in Ireland (Boilson et al., 2016). However, this is a marked increase in the prevalence as officially reported in 1984 as 4 in 10,000 (Department of Education and Sciences, 1993). Autism diagnoses have been described as increasing at alarming rates over the past 20 years (Hensel, 2017; Boilson et al., 2016; Chen et al., 2014). Latest figures from the United States Centres for Disease Control indicate that currently one in 68 children has an autism diagnosis, with boys being four-times more likely to be autistic, or at least diagnosed as such (Christensen et al., 2016). There has been no conclusive evidence found, to indicate what has caused this supposed increase. Some argue it is not a true increase, but suggest it is related to greater awareness around the importance of early intervention and therefore, emphasised early diagnosis, using broader diagnostic tools (Johnson, 2016). Others argue that it is a disorder of high intelligence that has increased as we evolve as human beings – our brains tripling in size, creating problems such as the processing of information at too great a speed (Crespi, 2016). This claim marks a significant contrast to the long-standing but inaccurate association of autism with intellectual disability (Hill et al., 2017). Similarly, the unsupported and damaging theory of the ‘refrigerator mother’ causing autism, based on Leo Kanner’s early research has also been debunked (Chown and Hughes, 2016).

Scientific research increasingly points to genetics playing a key role in causing autism (Persico and Napolioni, 2013). Simon Baron-Cohen who is director of autism research at University of Cambridge suggests increased assortative mating (where both parents, or at least the fathers of both parents, are employed in high-systemising occupations – such as engineering) as a possible contributory factor (2006). More recent research on twins and autism, suggests that autism is predominantly caused by genetic factors (Tick et al., 2016).

Whatever the cause, there has been an increase of 78 per cent in autism diagnoses between 2007-2012 in America alone (Blumberg et al., 2007), almost matched by a 79 per cent increase in diagnoses in Australia from 2009-2014 (Australian Bureau of

Statistics). Whether this is due to the availability of more reliable diagnostic tools, remains to be seen. What is certain, is that more (diagnosed) autistic people than ever before are now entering the labour market (Hensel, 2017). This is also due to greater improvements in supports in education settings, which have seen a growing number of autistic people to enter universities, many of these colleges have access programmes (Hensel, 2017; Chen et al., 2014; Roux et al., 2013; Shattuck and Roux, 2015). The next logical step from education is entering the workplace. However, this is where the support is suddenly withdrawn and autistic people find themselves at a cliff-edge in terms of support – educated but unemployable (Hensel, 2017; Chen et al., 2014; Vogeley et al., 2013; Gal et al., 2015; Roy et al., 2015). Without continued support in employment, autistic people can regress when leaving school (Shattuck and Roux, 2015) and their quality of life can decline significantly once supports that were in place are removed (Jennes-Coussens et al., 2006). The measures taken to ensure autistic children achieve similar educational outcomes to their typically developing peers are not succeeded by an equally effective employment-related resource once they leave full-time education (Richards, 2012). Further research in this area is urgently required to help meet the needs of this growing population (Anderson et al., 2017) as employers can no longer afford to ignore it (Johnson and Joshi, 2016). The difficulties experienced by autistic employees and their employers will be discussed in more detail in the disclosure, support and difficulties section below.

Autism and Neurodiversity

Autism been studied for almost 80 years using the medical model, approached as a pathology. Due to the lack of biological markers, this model identifies disorders and deficits based on behavioural deviations from what is considered typical or average; which is problematic in that no distinction is made between conditions resulting from poor person-environment fit, and deteriorating diseases that could be fatal (Baker, 2011). During the period from the mid-1990s onwards, while more and more children were being diagnosed as autistic, a type of social/political movement was quietly gaining momentum internationally; known as the neurodiversity movement (Singer, 2016; Silberman, 2015). The message of the movement was that neurologically different people should not be seen as disabled, but rather as having a different natural variation. This movement was largely facilitated by advances in information technology, which allowed a once isolated group of people gather together and support one another, without the complications of face to face interaction or sensory challenges of physically meeting up. The term 'neurodiversity' was first coined by sociologist Judy Singer (1999), who published an article from her Master's thesis that chronicled the difficulties her mother, who Singer now recognises as an undiagnosed autistic, experienced throughout her adult life. Many autistic people have discovered the neurodiversity movement online (Kapp et al., 2013). Blume, who is co-credited with coining the term in a 1998 Atlantic article (which was published before Singer's thesis) remarks, "the impact of the internet on autistics may one day be compared in magnitude to the spread of sign language among the deaf" (cited in Silberman 2015, p. 453). Singer, who drew from the work on disability activism of Lennard J. Davis (1995), called for autism, neurodiversity and indeed all disabilities to be studied,

discussed and researched from a social model. She argued that the entire concept of disability is after all a social construct, created by a predominantly able-bodied society (Davis, 1995; Davis, 2015; Singer, 2016). As Davis writes, “the disability isn’t ‘in’ the person, so much as it is ‘in’ society” (2015, p. 229). Viewing disability from a social model, he argues, removes the drive for a cure and replaces it with accommodations and removal of barriers. Singer claimed she “wanted to do for neurologically different people what feminism and gay rights had done for their constituents” (cited in Silberman, 2015, p. 453). Thanks to the growth of the social model of disability, it is becoming increasingly clear that so many of the challenges that once defined neurodivergent people, are simply the result of coping in societies and workplaces designed exclusively for neurotypical people (CIPD, 2018). To further understand the premise of the neurodiversity movement, see a list of definitions from the past 20 years below.

Figure 1: Definitions of neurodiversity

Blume (1998)	"Neurodiversity may be every bit as crucial for the human race as biodiversity is for life in general. Who can say what form of wiring will prove best at any given moment? Cybernetics and computer culture, for example, may favour a somewhat autistic cast of mind."
Singer (1999, p. 64)	"[Neurodiversity is where:] the 'neurologically different' represent a new addition to the familiar political categories of class/gender/race and will augment the insights of the social model of disability"
Baker (2006, p. 15)	"Neurodiversity describes features of neurological difference associated with individual or community identity that is a more or less elective choice of those experiencing neurological difference"
Fenton and Krahn (2007, p. 1)	"The neurodiverse (...), seek (...) better social support mechanisms, greater understanding from those around them or those who treat them, and a recognition that, though they are neurologically, cognitively and behaviourally different, they do not necessarily suffer from being neurodiverse nor do they need to be cured"
Glannon (2007, p. 1916)	"neurodiversity" (...) celebrates differences in the unique cognitive and affective capacities of people who fall along different stages of the neuropsychiatric spectrum. (...) [It] forces us to ask what counts as a mental

	disorder, and whether certain mental traits that deviate from those of the general population should be characterized as differences rather than disabilities.”
Robertson (2010)	“the neurodiversity perspective describes the neurology and personhood of autistic people through the lens of human diversity. This understanding of neurological-developmental disability has been influenced by societal diversity in ethnicity, religion, gender, nationality, handedness and sexual orientation.”
Armstrong (2010, p. 4)	“[the definition] includes an exploration of what have thus far been considered mental disorders of neurological origin but that may instead represent alternative forms of natural human difference.”
Jaarsma and Welin (2012, p. 21)	“One aspect of the neurodiversity claim is that autism (or some other neurological condition) is a natural variation among humans. Being neurodiverse or neurotypical (“normal”) are just different ways of existing as humans. The second aspect of the neurodiversity claim is related to rights, non-discrimination and other more political issues.”
Kapp et al. (2013, p. 59)	“The neurodiversity movement challenges the medical model’s interest in causation and cure, celebrating autism as an inseparable aspect of identity”
Walker (2014)	Neurodiversity (...) [is not] a ‘perspective’ or ‘viewpoint,’ but a biological characteristic of the human species, of which autism is just one manifestation (...), the neurodiversity paradigm [is] a perspective, and the neurodiversity movement [is] a social movement that promotes the neurodiversity paradigm.”
Sumner and Brown (2015, p. 77-78)	“Neurodiversity suggests that each (...) [neurologically based disability] is a natural variation in brain differences and, as such, it should not be medicalised, nor should attempts to change individuals with these variations be made. Instead, the neurodiversity movement argues that institutions within our society (e.g., schools, workplaces) should find ways to accommodate such variations.”

<p>Silberman (2015, p. 16)</p>	<p>“Neurodiversity [is] the notion that conditions like autism, dyslexia and attention-deficit/hyperactivity disorder (ADHD) should be regarded as naturally occurring cognitive variations with distinctive strengths that have contributed to the evolution of technology and culture rather than mere checklists for deficits and dysfunctions.”</p>
<p>Baron-Cohen (2017, p. 746)</p>	<p>“The notion of neurodiversity is highly compatible with the civil rights plea for minorities to be accepted with respect and dignity, and not be pathologised.”</p>

Meanwhile as internet access became more widely available and became the communicative medium of choice for many autistic people (Benford and Standen, 2009), the first Americans with Disabilities Act (ADA) 1990 came into force. This was a somewhat flawed piece of legislation as it required individuals to prove that they had a disability that substantially limited life activity, while simultaneously proving they were functional in the workplace. Essentially this meant if you were not disabled to the extent that you could not perform activities, than you were not protected by the ADA legislation (Davis, 2015). This anomaly led to 93 per cent of all ADA plaintiffs losing their case at the summary stage (Hensel, 2017). Following the first draft of this legislation the employment rate for disabled people in the USA actually dropped (Acemoglu and Angrist, 2001). The 2008 amendment of the Act proved a far more successful piece of legislation in protecting disabled workers.

Proponents of neurodiversity campaign for support systems (for example, inclusion focused services around employment and independent living) which permit people who do not identify as neuro-typical to live the way they want to instead of being forced to conform to societal norms (Singer, 2016). The notion of norms and their enforcement on the disabled community is explored by Davis (1995), who states that as the word ‘normal’ only entered the English dictionary in the mid-19th Century, the closest allusion to its meaning before then was ‘the ideal,’ which Davis (1995) argues continues to shape what society at large, currently considers as the norm.

Singer’s (2016) version of neurodiversity refers almost exclusively to high-functioning autistic people and the autism rights movement, from where the concept of neurodiversity originally grew (mostly online). More recent interpretations of neurodiversity consider it inclusive of people with other types of neurological differences such as attention deficit hyperactivity disorder, dyslexia, dyspraxia, Tourette’s syndrome, developmental speech disorders, epilepsy and bipolarity (National Symposium on Neurodiversity at Syracuse University, 2011; Jaarsma et al., 2012). Essentially neurodiversity is a social and political movement that calls for the respect and recognition of neurological differences as any other kinds of human

variations (race, sexuality, gender, religion). Much of the existing research into neurodiversity places it in binary opposition to the medical model, which seeks to prevent and cure autism (Baker, 2011). Baron-Cohen (2017) writes that there is no singular way for a brain to be normal; he believes that neurodiversity as a concept is helpful in creating a more ethical approach to neurological difference, which promotes the use of non-stigmatising language about those who may or may not have disabilities

He adds that it marks a departure from a pathological framework, with disproportionate emphasis on the challenges a person has, instead of equal consideration being placed on what they can do. He concludes that recognising the importance of difference (genetic or biological) in a person's sense of identity, should be respected the same way other types of diversity are.

Criticisms of the Neurodiversity Movement

A significant part of Singer's work is the introduction of the term, but she also cautions of the tendency towards social-constructionist fundamentalism within the disability movement in general, from which lessons can be learned for the neurodiversity movement. She argues while it is reasonable to challenge the reinforcement of stereotypes in using language like a person 'suffering' from a particular disability, it is unrealistic to remove the existence of suffering altogether, a notion she felt the wider disability movement seemed to support. She contends that this restrains the paradigm from gaining momentum. Autism is diagnosed on the basis of deficits and difficulties in social skills and communication (American Psychiatric Association, 2013). High-functioning autistic people apparently recognise and acknowledge these deficits (Kapp et al., 2013) and some accept interventions and strategies to improve them. This desire to ameliorate their symptoms, challenges the social model of disability which suggests that oppression alone causes the disability (Beauchamp-Pryor, 2011). Singer is supported by Ne'eman (2010) and other neurodiversity advocates, who recognise the interrelationship between internal challenges as well as social ones (Baker, 2011; Kapp et al., 2012).

The movement is not without its critics. As mentioned, neurodiversity is often criticised for including only high-functioning autistic people, ignoring those who are on the lower-functioning end of the spectrum. Ortega (2009) cautions on the potential for identity politics to obliterate difference entirely, disqualifying the experiences of the neurotypical; he claims that while it is understandable that some groups in the neurodiversity movement are offended by the pro-cure stance of the medical and professional communities, the neurodiversity movement does not represent every autistic person – it constitutes a minority within the total spectrum. He contends that the major challenge for the movement is reconciling the desire for a new, non-pathologised type of identity and community, without the "reductionist identity politics" (2009, p. 427).

Similarly, while the movement rejects the use of the words disorder and dysfunction, there is some confusion around comorbidities, such as language disorders or epilepsy. Baron-Cohen (2017) argues that epilepsy, while commonly occurring with autism, is not autism itself, but a sign of a brain dysfunction that requires medical treatment, and therefore should be considered a disorder. He argues that the concepts of disability and neurodiversity are compatible; but disorder and neurodiversity are not. The term disorder, he writes, can be used where the person cannot function, despite different environmental conditions. Autistic people can function as well as, if not better than typically developing individuals, when in an autism friendly environment (Baron-Cohen, 2017).

This research uses Singer's interpretation of neurodiversity (2016), which is also supported by Jaarsma et al. (2012) and Hensel (2017). That is to be neurodivergent is to be autistic and "sufficiently high-functioning to be capable of holding mainstream, independent employment" (Hensel, 2017, p. 73).

Autism and Employment

Education and employment are human rights. The right to reasonable accommodation according to the Irish Human Rights Commission means; "an employer cannot decide that a person with a disability is incapable of doing a particular job without considering whether there are appropriate measures which they could take to support the person to carry out the required duties" (2018). The high rates of unemployment and underemployment of autistic people are cause for concern, particularly as more and more autistic people enter the workforce (Hensel, 2017; Roux et al., 2015; Anderson et al., 2017; Chen et al., 2014). It is estimated more than 10 per cent of the population is neurodivergent (CIPD, 2018). Current levels of employment for autistic people range between 20 and 30 per cent in the US (Wilczynski et al., 2013), with only 15 per cent employed in full-time work in the UK (Mavranouzouli et al., 2014). Similarly, the majority of employment positions held by autistic people are unskilled and poorly paid (Howlin et al., 2005). These figures paint a bleak picture and challenge the claims that autistic people can excel in employment, given the correct organisational support (Howlin et al., 2005). While the long term costs are greater where an autistic person is excluded from the workplace a recent study by Mavranouzouli et al. (2014) found it was more cost-effective to support employment for autistic adults when compared with standard care services (day services) for adults in the UK, and had significant positive implications on the subject's self-esteem and independent living skills. These findings are supported by Wilczynski et al. (2013), who argue that while the cost of supporting these adults is greater than supporting those with almost every other disability, the greater long-term cost is to ignore the critical employment supports that will help the growing neurodivergent population integrate into employment. Again, this is from a social responsibility perspective.

As Wehman et al.'s (2016) study included subjects across the spectrum, high level supports were required at the outset. However, others on the autism spectrum may not require such supports. There can be more discreet levels of support from the employer to the autistic employee around areas such as leadership style (Parr et al., 2013). Supported employment services can help people with developmental disabilities find employment, but the level of support can differ considerably. While supported employment services often cater for a broad range of disabilities, including support for those with intellectual disability; autistic employees could benefit more from these schemes when starting their career (Beal and Crockett, 2010). Later on in their career, autistic people could benefit from on-site support in dealing with organisational, sensory or social deficits (Rashid et al., 2017), with one study showing 66 per cent of mid-career autistic people would welcome more support for their ASD, in the workplace (Baldwin et al., 2014). Another study suggests autistic people who aware of their social difficulties may refuse a promotion that requires greater social interactions or organisational skills, such as management (Rashid et al., 2017; Westbrook et al., 2015). Howlin et al. (2005) state that there is a growing understanding of the ability of neurodivergent people to excel in the workplace, but only with the appropriate organisational support. For example, Parr et al. (2013) found that individualised consideration was beneficial for autistic employees, while idealised influence presented a challenge and increased levels of anxiety due to social communication difficulties and shared understandings or theory of mind. This demonstrates that some minor changes in communication could yield positive results for the employer and the employee. Some companies, such as Weir Minerals, Salesforce, Bankwest, Hewlett Packard, Paypal and Microsoft have committed to finding employees on the autism spectrum to increase innovation by diversity of perspectives in the creative process, yet there is little research to support these claims. One large corporation, SAP, has even committed to ensuring that people with ASD will account for 1 per cent of its global workforce by 2020 (Jones, 2016). While these measures garner media attention, the evidence upon which these claims of increased innovation are based, is not available from any literature found in this review.

Despite the underrepresentation of autistic people in the workplace there is a real desire among many autistic people to work (Baldwin, 2014). There are added benefits for the autistic person, such as improved health and the reduction of maladaptive behaviours and autism-related symptoms (Taylor et al., 2014); and also higher levels of self-esteem (Johnson and Joshi, 2016) and improved social wellbeing (Roux et al., 2013).

The current state of research and academic evidence of employment supports for autistic people, particularly around the experience of employers and autistic people, is very weak (Shattuck and Roux, 2015; Wilczynski et al., 2013; Wehman et al., 2016; Chen et al., 2014; Hensel, 2017). Hendricks (2010) refers to the dearth of research on vocational supports for autistic people. Research into attitudes and

behaviour in the employment of disabled people has been targeted mostly at advocate groups and service providers, very little at employers (Karpur et al., 2014). In their review of the OECD and US literature on disability and employment, Waterhouse et al. (2010) noted that the focus on barriers, challenges and constraints from the disabled person's perspective dominated most of the research. Santuzzi et al. (2014) note that research on disability issues in the workplace has been more prevalent in disciplines such as rehabilitation psychology. Similar to the suggestions of Colella and Bruyère (2011) and Ruggs et al. (2013), they call for organisational psychologists to work with practitioners, legal experts, disability scholars and HR professionals to collaborate on for better policy development. It is recognised in the ICF (diagnostic manual) that contextual and environmental factors have a role in the disability experience, yet there is very little research to draw from regarding employer-related factors that affect the labour market engagement of people with disabilities (Karpur et al., 2014). As per the old medical model, a lot of research exists on treatment and potential causes, but as the method section below will show, searches in social science databases focusing on autistic people in employment, do not yield many results.

Disclosure and Supports

Disclosure

There is a body of research on disclosing an autism diagnosis to an employer and the stigma that can be attached to such disclosures (Santuzzi et al., 2014; Prince, 2017; Rashid et al., 2017). In their analysis of invisible disabilities, Santuzzi et al (2014) identify two difficulties associated with disclosure. Firstly, the very nature of hidden disabilities makes them hard to identify and diagnose. Such difficulties extend to the autistic individual personally and make their own detection and acceptance of the disability an essential part of the process. Once the autistic employee is aware of their disability there is opportunity for concealment, which can have very negative effects on job performance, mental health and interaction with colleagues (Beatty and Kirby 2006). Erving Goffman (1963) defined stigma as a source of shame imposed on individuals by society, where those individuals have characteristics that are discredited. Consequently, he says, "because of the great rewards in being considered normal, almost all persons who are in a position to pass [as normal] will do so on some occasion by intent" (1963, p. 74). However, disclosure is vital for reasonable accommodations to be made, so this is an important first step in the process.

The second part of the disclosure process as proposed by Santuzzi et al. (2014) is the decision to disclose to an employer, which can present a number of challenges around stigma and acceptance. As an invisible disability, employers and colleagues might not understand a diagnosis and may judge or discriminate based on their

assumptions (Santuzzi et al., 2014; Prince, 2017). Although ASD is not officially regarded as a mental illness, there are many co-morbidities such as depression, anxiety and obsessive compulsive behaviour that are associated with it. Mental illness is regarded as one of the most highly stigmatising conditions (Dalgin and Bellini, 2008), which is a major factor in concealment. People with known disabilities may be viewed as needy, left in low-level positions or overlooked for team projects (Prince, 2017). In their qualitative analysis of 14 successfully employed autistic individuals, Hagner and Cooney (2005) do not specify if the sample is of employees with HFASD or not. Similarly, all employees are in community employment with very junior positions such as a dishwasher, cleaner, cashier and deli assistant.

Autistic employees' performance and ability to cope in the workplace can be affected by difficulties with executive function, memory and attention (Baker-Ericzén et al., 2018). These difficulties could manifest in areas like teamwork, making small-talk with colleagues and adapting to change (Richards, 2012). Other causes which interfere with performance include changes in routine, unexpected down time or unusually loud environments (Hagner and Cooney, 2005). Autistic employees are particularly vulnerable to incidents of workplace bullying and victimisation, due to difficulties reading non-verbal cues and social skills (Attwood, 2006; Higgins et al., 2008). While autistic female employees are at a far greater risk of burnout than any other employees (Baldwin and Costley, 2016). Once the employee discloses their disability, they are legally protected and reasonable accommodations must be provided. However, due to the stigma attached to disability, Prince (2017) urges caution in choosing to disclose. This approach is supported by Whetzel (2014) who advises against disclosing before the autistic employee accepts the job, which she says, shows the employee was qualified and requires evidence of why the job offer was revoked, if that were the case.

Supports

Adapting the physical environment, job adjustments and behaviour support have been identified as three main areas that autistic people and their employers require, regarding such accommodations (Scott et al., 2015). Ellestad et al. (2023) identify key aspects of the interview process, for example, that cause heightened yet avoidable stress for high-functioning autistic people. They identify four key themes in the challenges neurodivergent people face regarding interview structure, perceived competency, social camouflaging and forced normality. However, Baker-Ericzén et al. (2018) found that there is a very limited understanding among managers of the types of supports autistic employees require. Such supports extend beyond any kind of checklist for all autistic employees. Hagner and Cooney (2005) advise that supervisors play a key role in the performance of autistic employees, particularly around the supervisor's will and ability to intervene in a supportive way. Some employers create accommodations by using the same resources they apply for all employees, such as company-sponsored initiatives, policy changes or employee

assistance programmes (Unger, 1999). Key supervision strategies as identified by Hagner and Cooney (2005) include:

- *Job modifications*

These include consistent schedules and the outlining of duties, reducing social demands of the job to make it more manageable and predictable. Similarly, providing organisers which help structure and keep track of work. Ensure a back-up plan with some tasks or activities to reduce unstructured time.

- *Supervision*

Give direct and concise instructions. Show the employee what to do when training. Verify that communications have been understood and assist the employee in reading non-verbal cues. Explain and help the employee cope with changes on the job.

- *Co-worker relationships*

Encourage all workers to interact with each other and assign a couple of co-workers to support the autistic employee with job-related suggestions and to look out for the employee, like a buddy-system.

- *Support services*

Reassure staff and the autistic employee and build a sense of familiarity between them, as they get to know each other. As this relationship grows, transfer the support roles to the staff. Check in regularly to avoid conflict and maintain a role to liaise with the autistic employee for non-work related difficulties that may affect the job.

Hagner and Cooney (2005) report on the excellent performance evaluations these autistic employees received. However, Ren et al. (2008) suggest there can be a paternalistic performance review of employees with disabilities, with more generous reviews of performance. It is worth noting Hagner and Cooney's (2005) strategies were created for employees in community employment and no information on whether the employees had HFASD or not was sought by the authors. It could be worth modifying the strategies for different types of employment depending on the needs of the autistic individual, pay attention to person-job fit. However, as some autistic people choose not to disclose their diagnosis (Prince, 2017), they can find it difficult to maintain a job as their managers and colleagues can perceive atypical behaviours or communication as deviant or disruptive (Rashid et al., 2017). Without disclosure, even if the employer suspects the employee has a disability, all behaviour must be interpreted without disability as a factor (Santuzzi et al., 2014). Scott et al. (2015) identifies a need for more effective communication between employer and employee to ensure better understandings of accommodations and job expectations to create an effective neurodiverse workforce.

Existing Reviews

During the course of this research I found six systematic reviews on various aspects of employing autistic people, outside of my own database search and analysis for this study. These articles did not meet the criteria for inclusion in the analysis section. Due to the lack of published articles in the field of autism and employment, these were deemed worthy of note to illustrate the state of existing research currently available.

Taylor et al. (2012) conducted a systematic review of vocational interventions for autistic adults, but as they excluded all studies with less than 20 participants, only five studies met their criteria; which they regarded as low-quality. They concluded that there was little evidence available for specific approaches to vocational treatments, despite some successful outcomes from supported employment interventions.

Walsh et al. (2014) reviewed 26 studies, found from the following databases: Academic Search Complete (EBSCO), ERIC, Scopus, PsycInfo and Psychology and Behavioral Science

Collection (EBSCO). They assigned each one into the following categories: predictor, impact of employment and intervention and suggested a combination of personal and external factors served as the predictors of employment in autistic individuals. Of the 26 articles, 17 were included in the intervention category and included: reinforcement-based approaches, video modelling, combined video modelling, cues and visual supports as examples of such interventions. There was no assessment of the quality of the research designs and the effects of the interventions in these studies were not quantified in this review. Anderson et al. (2017) therefore question the strength of an evidence-base for the interventions included in this study.

Jacob et al. (2015) mined eight databases for their systematic review: ProQuest, Ovid Medline, Emerald, Cochrane Library, CINAHL Plus, PsycInfo, Web of Science and Scopus. Following the inclusion criteria, their review examined 11 articles and the authors concluded the scarcity of studies available was a limitation of their analysis. One of the most noteworthy findings of this review was that autistic individuals who can avail of vocational rehabilitation services for adults with ASD, have a strong chance of becoming employed – even if autism is the most expensive disability to provide vocational services for. This cost is offset by the strong potential of autistic people, according to the articles in this review at least, to obtain and maintain employment, given the right supports.

Seaman and Canella Malone's (2016) review was based on intervention studies, including school-based interventions, pre-employment and employment retention skills. They reviewed 20 articles (which included 21 intervention studies), rating the

strength of the evidence as presented, by using visual analysis instead of quantifying the effect size. The study did not conclude that any intervention strategies were evidence-based; and the authors highlighted a number of limitations in their research review. Rigor in some articles was considered one such limitation; the consideration of generalisation and maintenance and social validity (for example, real employment) were others. Despite the lack of an evidence-base in the research, audio and video based interventions were rated highly as intervention tools in most of the studies.

Anderson et al. (2017) featured 18 articles which used a single case research design, found in the EBSCO, ERIC, Scopus, PsycInfo and Ovid Medline databases. The authors quantified intervention strategies such as self-management, behaviour training skills training and video modelling. They categorised each study according to the following: intervention classification, setting, target skill, research design, findings including generalisation and maintenance and What Works Clearinghouse (WWC) standards classifications. They state that the outcome of interventions must be lasting and create generalised change for adaptive and useful behaviours in the workplace; but comment on the underreporting of social validity (only 9 of the studies addressed this), and write where this was included, “the appropriateness of target behaviours and acceptability of the intervention procedures were rarely considered” (p. 35). They concluded that the quality and scope of the research body is clearly limited.

Hedley et al. (2017) conducted a systematic review of employment programmes and interventions targeting adults with ASD. They included 10 review and 50 empirical articles in their review and organised each one according to the following themes: “employment experiences, employment as a primary outcome, development of workplace skills, non-employment-related outcomes, assessment instruments, employer-focused and economic impact” (p. 929). The main findings were that attending employment support programmes leads to better employment outcomes (in both finding a job and receiving more hours and pay); factors such as being older, better educated and the provision of support and absence of any co-morbidities were also found to contribute to better outcomes. These findings are in line with Walsh et al.’s (2014) conclusions that personal factors are as instrumental as other intervention strategies.

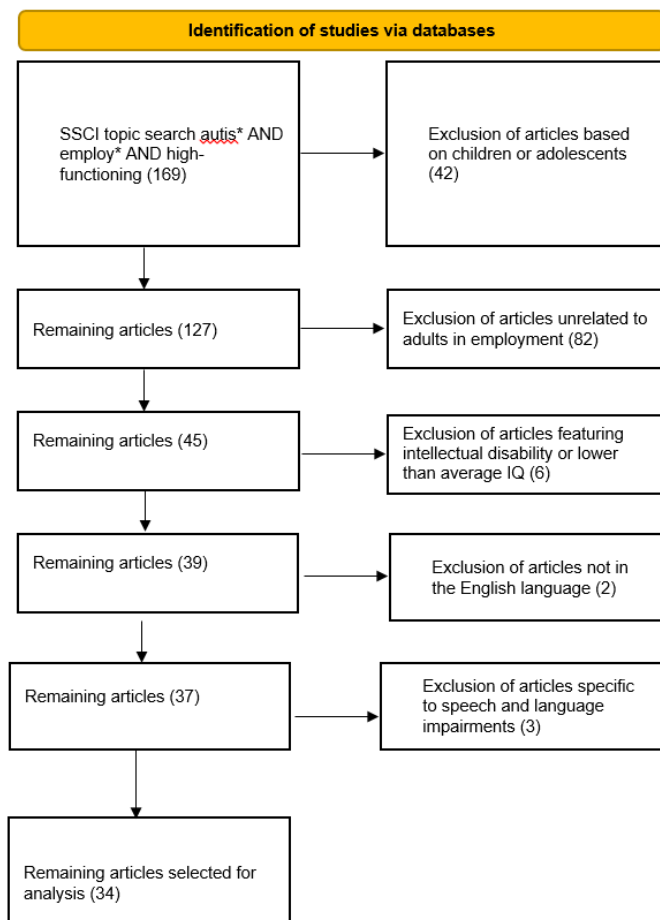
Two of the systematic reviews highlighted a gap in existing literature on neurodiversity and employment. One concluded that there are very few studies on employers and their perspectives regarding the employment of autistic people (Hedley et al., 2017); the other highlighted the need for an examination of the cost and cost-benefit ratio of employing an autistic person, from the employer’s perspective (Jacob et al., 2015). Another systematic review focused solely on the female experience of challenges in the workplace for high-functioning autistic people, but was excluded because it was limited to one group (Hayward et al., 2018).

Figure 2: Journal sources of publications on the topic of high-functioning autism, adults and employment

<i>Journal Title</i>	<i>Frequency</i>	<i>Percent</i>
<i>Journal of Autism and Development Disorders</i>	10	29.4
<i>Research in Autism Spectrum Disorders</i>	6	17.6
<i>Journal of employment counseling</i>	1	2.9
<i>Autism</i>	2	5.9
<i>Autism Research</i>	3	8.8
<i>Disability and rehabilitation</i>	2	5.9
<i>Work – A Journal of Prevention Assessment and Rehabilitation</i>	2	5.9
<i>Psychology in the Schools</i>	1	2.9
<i>Psychiatria Danubina</i>	1	2.9
<i>BMC Psychiatry</i>	1	2.9
<i>Harvard Civil Rights-Civil Liberties Law Review</i>	1	2.9
<i>Comprehensive Psychiatry</i>	1	2.9
<i>Psychological Reports</i>	1	2.9
<i>European Archives of Psychiatry and Clinical Neuroscience</i>	1	2.9

<i>Research in Developmental Disabilities</i>	1	2.9
<i>Total</i>	34	100.0

Figure 3: Prisma chart of literature selected for this review



Discussion

Although the data suggest that interest in autistic people in employment is growing, very few articles derive from a business management perspective. Despite the growth of the neurodiversity movement and articles in popular media, there remains a lack of research into the employment experience of autistic adults and their managers, peers, specialist or supported employment advisors, human resource managers that offers any guidance or insight into creating a positive outcome. The

medical model approach is still prevalent in much of the research, with therapeutic interventions aimed at reducing autistic symptoms being a primary focus in much of the current research. This approach is in opposition to the neurodiversity movement which embraces neurological difference and promotes acceptance. The movement is based on supporting autistic people and finding accommodations to help in areas like education and employment, instead of funding the search for a cure. A great deal of the focus in existing research is the negative prognosis for autistic adults regarding employment, independent living skills and quality of life. Even so, Dandelion programmes are popping up in many of the larger IT companies without any real evidence to support the advantages of such projects. There is a real need for academic research on best practice around creating neurodiverse hiring programmes, and retention policies, to ensure they support the employee, the manager and all parties involved in the employment experience, which would lend to a more inclusive and diverse workforce. Similarly, more rigorous studies are required to support the claims that neurodiversity programmes contribute to business performance.

Limitations

There are a number of limitations of this review; first and foremost is the exclusion of 'Asperger's' or 'Asperger syndrome' in the topic search, which undoubtedly excluded some studies on high-functioning autistic people and employment in the SSCI search. However, this was a conscious decision as Asperger syndrome was a separate diagnosis to autism prior to the publication of the DSM-5 in an effort not to exclude those on the higher-end of the spectrum, who were not diagnosed as having Asperger syndrome. While attempting to review the research of this topic in the social sciences literature, the lack of available studies meant that the sample size for this study was small. As demonstrated in parts of the review where articles outside the search criteria were used, the SSCI does not include all business and management journals. Another limitation was the use of articles published in the English language medium. However, as Europe, the USA, Australia and Japan are featured in the research, this shows the topic is one of global interest. A systematic review including international research on high-functioning autism and employment could offer more insight into the experiences of autistic employees and neurodiversity in management practice.

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