Neurodiversity and Inclusivity in the Workplace: Biopsychosocial Interventions for Promoting Competitive Advantage

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Research has demonstrated that diverse teams perform better and are more creative and innovative. As such, many firms in industry have established DEI programs, especially those where forward-thinking design cognition are competitive advantages. These efforts correspond with a global talent and worker shortage and align with the realization that neurodiverse populations are eight times as likely to be unemployed, while most actively desire and seek work opportunities. The technology sector has been the first to consistently identify, build, and promote programs supporting the neurodiverse population, leveraging a largely untapped resource. With an estimated 15-20% of the global population considered to be neurodiverse, greater attention is being paid to the different needs and skills of this growing and diverse. To promote a potential competitive advantage, and address the needs of a neurodiverse workforce, certain firms are adopting biopsychosocial interventions in the workplace, including integration of behavioral education, redesigning hiring, resource training for managers, and environmental adaptations.

Keywords: biophilic design, Neurodiversity, sustainability, wayfinding, smart cities, occupational health, productivity

INTRODUCTION

Studies of neurological or developmental conditions such as autism spectrum disorders (ASD) in the workplace have received increased attention over the past decade largely due to increased social awareness (Schall, 2010; Scott et al. 2018; Bury et al. 2020; Scott et al. 2022). Aligning with the concept of biodiversity, the idea of Neurodiversity asserts neurological development outside of the atypical "normal" human thinking is a biological variation, deserving both understanding and support. The term Neurodiversity was established in 1998 by Judy Singer, an Australian social scientist (Deakin, 2022). Baron-Cohen (2019) notes that proponents of the framing "argue that in a highly social and unpredictable environment some of the differences may manifest as disabilities, while in more autism-friendly environments, disabilities can be minimized allowing other differences to bloom as talents." In other words, environmental considerations are necessary as the nature of a typical workplace with open-concept floorplans and lack of sensory adjustments are disabling for a neurodiverse population (Gaudion, 2016; Harnett, 2019). Therefore, many who self-identify as neurodiverse do not consider the nature of their thinking a disability, instead, they argue environmental conditions are disabling from a learning and

performance standpoint. While the most well-known symptoms of Neurodiversity are specific to ASD – impaired communication, impaired or restricted social interactions, and repetitive actions or behaviors- there is a great deal of diversity of experiences and need for the broader population.

Neurodiversity encompasses many different types of brain functions and behavioral traits, including social communication, ability to recognize and express emotion, levels of attention, and other mental functions (Dawson, Franz, & Brandsen, 2022). Initial research on the topic concentrated on adopting the medical model of investigation, which calls for prevention and a focus on finding a cure to the serious impairments that are often associated with the conditions listed above. Discussions of the disabling symptoms found in psychological and medical resources evolved out of defining "the other" in the context of deficit highlighting from normative educational social history (Rogers & Vismara, 2008; Doyle, 2020). For example, Dyslexia appeared when the focus on literacy became mainstream (Politi-Georgousi & Drigas, 2020); ADHD issues emerged alongside the required sedentary lifestyles following the industrial revolution (Olsson & Hibbs Jr, 2005); autism concerns appeared with the ever-growing frequency of social communication and requirement of being immerse in controlled sensory environments of the office (Lawson, Mathys, & Rees, 2017). The very etymological origin of the term "disorder" derives from the unknown and is used when the symptoms behind the dysfunction have no known diagnosis (Wedgwood & Atkinson, 1872). At the same time, the use of the term "disability" suggests that diagnosed individuals are actually below the average expectation for neurological or physical functioning. Examples include comorbidities in the neurodiverse population. For instance, a recent study found that 50% of patients diagnosed with ASD also commonly have no less than four co-occurring conditions that may include learning difficulties and language disorders. 75% of individuals with autism also show tendencies aligned with ADHD, which is one of the most common neurological challenges, relating to working memory, impulsivity, prioritizing, focusing, remembering plans, multitasking, coping with stress and organization (Baron-Cohen, 2019).

Such frequency of overlapping conditions makes traditional career trajectories challenging for the neurodiverse community. According to the University of Connecticut Center for Neurodiversity and Employment Innovation, rates of unemployment for adults with neurodiverse conditions is 30-40%. The rates are three times that of other disability groups (Harper, 2022). Furthermore, figures from the National Autistic Society show that despite 77% desiring to work, there are only 16% of adults with autism working full-time as opposed to 47% of other disabled people (National Autistic Society, 2021). One of the issues faced by neurodivergent adults who are eager to have a career are non-inclusive hiring practices, lack of retention programs and supervisor training, and perceptions that their skills do not align with those needed in a given firm. Issues which most often arise include the inability to initiative or maintain a conversation and inability to keep eye contact during the interviewing process immediately takes many out of the running for employment (Anderson, Butt, & Sarsony, 2021). Many aspects of neurodiverse experiences influence all parts of the individual's life, including their talents and struggles as interwoven into personal and professional life goals. In essence, occupational success or failure is often out of the control of a population that is highly motivated, intelligent, and eager to work.

At the same time, a neurodiverse workforce is a panacea for challenges faced by industry today. Career development is no longer a linear trajectory and many variables have led to labor shortages. For instance, Lindstrom et al. (2007) noted that career decisions are tied to roles within family units and often dictate when and if individuals enter or re-enter the workforce. The non-linear progression has also been highlighted in research and the news recently with the belief that younger generations, starting with Millennials, change careers earlier and more frequently, leading to a labor shortage in many areas (Sian, 2013). Recently, another trend has emerged that concerns employers known as "quiet quitting" and has been cited among Gen Z workers (Strahilevitz, 2022). A reconsideration of priorities and work-life balance has led many employees to avoid going beyond their basic job requirements and functions. The struggle to attract and retain young talent has serious economic consequences when turnover is high (Ji et al. 2022).

With a shrinking talent pool, industry needs to consider a new strategy. Studies show neurodiverse employees were found to be more motivated and more productive than neurotypical employees under specific conditions. For instance, research has demonstrated professionals with autism are more productive

than average employees (up to 140%, in fact) (Bury et al. 2020). It should be noted, programs flourish after adapting to meet the needs of the neurodiverse community. Raymaker et al. (2022) report in a study of autism in the workplace that destigmatizing neurodiverse conditions is paramount to ensure a safe working environment. Supervisors are also central to facilitating office culture and working conditions. When interviewed, not surprisingly, neurodiverse participants defined success the same way most workers do and desire work-life balance, opportunities for professional growth, a sense of community, financial independence and having work that is meaningful. To support this population, strategies require a biopsychosocial approach focusing on the whole individual- their environment, as well as psychological and biological factors (Raymaker et al. 2022). Attending to all three areas results in much lower attrition and turnover with neurodiverse employees compared to average workers.

The integration of neurodiverse employees has resulted in lower defect rates and higher productivity, not to mention improved sales, services, and products. Companies have seen overall improvement in communication for such employees when policies are set to avoid unnecessary and ambiguous communication, such as nuances of irony, colloquialisms, and sarcasm (Jones, 2015). Even neurotypical employees report their involvement with these programs has improved their morale and made their work more meaningful (Morris, Begel, & Wiedermann, 2015). The appreciation of the experience creates a workforce that is loyal with low rates of turnover in both populations. The low churn also confers program resiliency and confers reputational benefits (Kwon & Rupp, 2013). Therefore, in order to promote a potential competitive advantage, and address the needs of a neurodiverse workforce, firms should adopt a biopsychosocial model in the workplace. The model emphasizes the interconnected nature of our work lives in biological, psychological and socio-environmental areas. Addressing just one will not result in a value proposition as programs require staffing, overhead, administrative support, and employee buy-in- all of which take resources, time, and money. But the return on investment has already been realized by many firms in sales, revenues, and human capital retention. The following review of theories and best practices is designed to assist human resource professionals and employers support a neurodiverse workforce. Programs which restructure hiring practices, educate supervisors, adapt to environmental requirements, and demonstrate empathy towards worker needs result in greater career commitment, reduced turnover, as well as improved self-esteem, self-efficacy and job performance among personnel.

LITERATURE REVIEW

Understanding Neurodiversity

Given that the potential pool of global neurodiverse workers number around 1.2 billion, efforts should be made by firms to better understand their unique needs, skills, challenges, and aspirations (CDC, 2022). In the last two decades, approaches to neurodiversity have shifted from treatment to support and from diagnostic to identity-first language (ASAN, 2022). Many who self-identified as neurodiverse questioned the negative bias instilled in early terminology, leading to Neurodiversity replacing the category of "Specific Learning Difficulties" within educational psychology in 2000 and within occupational psychology in 2010 (Dwyer & Sadhbh, 2022). Before 2000, studies on autism spectrum disorders (ASD) sought to mitigate the "burden" those diagnosed would have on caretakers and society in general. The goal of treatment, such as with Applied Behavioral Analysis (ABA) therapy was to identify non-desirable behaviors and set them for "extinction" to ensure patients could be "normal" (Senokossoff, 2016). The current language, on the other hand, prefers alignment with the notion of "difference," and not denigration, when referring to variations in a trait. This supports the consideration of natural differences in the way the human brain interprets information (Griffin & Pollak, 2009; Murray et al. 2022). The terminology aligns with the scientific understanding that five to fifteen percent of autism may be attributed to rare genetic variances or mutations. These variances do not only cause autism, but other developmental delays that may be categorized as disorders. Moreover, 10-50% percent of the variance in autism is attributed to common genetic variances such as single nucleotide polymorphisms, as Wosniak et al. (2017) point out. These are the most common type of genetic variation in humans and are not unusual but can lead to different forms of Neurodiversity (Wozniak et al. 2017).

ADHD and Neurodiversity

One of the most common forms of Neurodiversity is attention deficit/hyperactivity disorder (ADHD). In fact, ADHD is so common in popular culture as a diagnosis among children, that the disorder is often not included in discussions of neurodiverse populations (Sonuga-Barke & Thapar, 2021). Despite this, employers should certainly take note of the characteristics in order to support their workforce. In research on ADHD, differences in the size and productivity of the regions of the brain vary. For example, areas in the brain, such as the amygdala, have been found to be larger in neurodiverse populations in childhood and relate to an increased hypervigilance as the region is the survival part of the brain that controls the "fight or flight" instinct (van Harmelen, 2013). Other studies of ADHD individuals revealed more neurons located in the frontal lobe, which suggests neural pruning of connections and reduced apoptosis which has been used to argue for replacing the "D" in ADHD with "difference" instead of "disorder" (Shelton et al. 2011; Hess et al. 2018). The categorization of ADHD is marked by tendencies of the inattentive type, epitomized highly energetic and active hyperactivity and impulsivity, or ADD, which manifests as inattentive, where the individual appears shy and does not focus as society requires (Filipe, 2022). Along with the previously mentioned neurological implications, scientists have observed that levels of dopamine are different in people with ADHD, leading to the initial hypothesis that ADHD occurs because of low levels of dopamine (Xing et al. 2022). Dopamine is a neurotransmitter stimulated in our brains which gives a positive surge to an individual after receiving external validation. This may be the culprit behind why many ADHD individuals with dopamine deficiencies have a history of being considered "needy" or "demanding", traits we are socialized to see as deficits in character and more often attributed to women (Will, 2022). Modern socialized gender constraints which require masking potential negative behaviors contribute to many cases of undiagnosed ADHD, particularly with women who were previously misdiagnosed as having anxiety or depression. Masking is quite common in neurodiverse individuals and includes concealing the physical and emotional symptoms of their conditions (Radulski, 2022). It is important to note there was a great disparity in the early bias of diagnosis toward white men. As well, most of the initial spectrum researchers were older white men, which led to a biased focus in the research on male autistic characteristics (Santos et al. 2022).

The belief those with ADHD have a dearth of attention, however, is misplaced. There are efforts in the neurodiverse community for replacing "deficit" with "disorder" (from the negative pathology disease perspective), as the notion of a "lack of" is inaccurate as most individuals have abundance of attention, but struggle controlling it (Yavari Barhaghtalab et al. 2022). Instead, the acronym VAST or "variable attention stimulus trait" has been proposed as a more accurate and descriptive diagnosis (Hallowell & Ratey, 2022). ADHD/ADD individuals are known for having difficulty with executive task functioning, which leads to difficulty maintaining emotional and impulse control, task initiation, prioritization, working memory and flexible thinking. The positive aspects of ADD and ADHD are these individuals can become hyper-focused with intense levels of productivity for extended periods, are usually creative, inventive, spontaneous, and energetic (Fabritius, 2022). All traits currently sought after by companies trying to create better cultures and invigorate the return to office efforts.

Autism Spectrum Disorders (ASD) and Neurodiversity

ASD is more visible now than ever thanks to popular culture. Representation, however, has unnaturally biased an association of autism with white males. The stereotype was established with films such as *Rain Man* (1988) where socially awkward or inept men demonstrate genius-level abilities. Hollywood has since continued the association and identification with characters such as Sheldon Cooper from *The Big Bang Theory* television series (2007-2019) and Christian Wolff from the film *The Accountant* (2016). These examples perpetuate the myth of superpowers of intelligence along with social and communicative deficiencies in the narrative of the allusive genius who, when given right support, environment, and tools, can succeed (Pomerance & Palmer, eds. 2022). Some neurodiverse coaches advocate understanding limitations and supporting skills by effectively removing environmental hinderances in order to enable cognitive superheroes (Stallings, 2022). Unfortunately, the strategy focuses only on the sought-after traits, while overlooking the nature of a spiky profile, referencing an individual with large gaps between their strength and weakness (Howell, Bradshaw, & Langdon, 2022). The drawback of such a profile means areas

of challenges and areas of giftedness might be more pronounced, outstanding in some areas, below average in others. In actuality, research identifies the deficits in the ASD population in three areas or domains. These core deficits include difficulties with communication, social interaction, and with limiting repetitive behaviors. Therefore, those with the disorder often have difficulty understanding their own emotions, whereby their facial expressions, language and physical gestures may not accurately reflect their internal emotions. ASD is often accompanied by differences in speech porosity, such as rhythm and intonation which help express emotion and convey meaning. The differences interfere with an individual's communication and spoken social abilities, which may result in possible misinterpretation from others. Alternatively, as noted, individuals also have difficulty with nuances in traditional communication, such as humor, sarcasm, or witticisms (Araujo, Mophosho, & Moonsamy, 2022). Clear and literal communication is key, as well as expectations and tasks.

Sensory Stimuli and Neurodiversity

The neurodiverse population, as with the neurotypical, all process sensory stimuli and information differently depending upon their experiences. Sensory information experiences are unique to individuals and may lead to certain heightened stimuli, which are made up of an experimental history of discovering which sensations are positive, sought out or avoided. Commonly the brain may even see outside noises and lights as a potential threat, which results in a survival response outside of the individual's conscious control (Bellato et al. 2022). Where others can go through a catalog of past experiences to reference as a play guide to our natural fight or flight response, the tendency of neurodiverse individuals is to be in a regular hypervigilant state. The experience is common for a range of neurodiverse individuals, including those who have difficulty regulating their own nervous system due to sensory sensitives or PTSD cognitive patterns (Elton et al. 2022). In fact, the enlarged amygdala commonly found in CT scans of youths with ASD are considered to be the root cause of nervous system overloads (Andrews et al. 2022). When an individual with ASD is unable to withstand the stress of their environment, the emotions can manifest as what it termed a "meltdown," in which they can be violent or others may cut off all communication and withdrawal (Karim, Akter, & Patwary, 2022). When the amygdala becomes engaged there is no connection to the forebrain, the primitive amygdala takes over and when nervous system control is not possible, the prefrontal cortex can actually go "offline." The front portion of our brains is responsible for self-control, concentration, and focus. These instances can lead to cognitive shutdown, result in migraines, rumination of lowered self-worth, or being overwhelmed by feelings of extreme hopelessness. Hence the need to be attentive to environmental stimuli in a neurodiverse workforce is key.

Workplace and Neurodiversity

There are many positive contributions of neurodiverse individuals in the workplace, but often other attributes can be accompanied by misunderstanding. For instance, despite stereotypical depictions of being aloof or emotionally unresponsive, the population is rather quite empathetic and can be easily discouraged (Shalev et al. 2022). Along with the common co-occurrence of ADHD, neurodiverse individuals are very susceptible to negative thinking, such as catastrophizing (expecting worse-case scenario), which leads to periods of prolonged anxiety and/or depression (Kasahara, 2022). Especially in cases of women who go undiagnosed, challenges at work may manifest in feelings of shame due to perceived personal flaws. In these instances, women commonly hide their challenges from colleagues and can misinterpret relationships with mangers as being toxic (Ginapp et al. 2022). Studies have shown ADHD employees have a tendency to feel underutilized and as a result can have lower self-esteem than other workers (Harris, 2020). As a whole, neurodiverse individuals tend to experience criticism more harshly than neurotypicals. The most severe manifestation represents rejection sensitive dysphoria (RSD). This is characterized as an emotional response to criticism or negative feedback which leads to an intense psychological pain related to feelings of rejection. The word "dysphoria" stems from ancient Greek entomology describes a strong feeling of pain or discomfort (Dwyer, 2022). The manner in which feedback is provided by supervisors should be carefully considered and rooted in measurable facts to ensure the appropriate results are achieved.

In the face of multiple obstacles and the difficulty of interpersonal challenges for those with different cognitive abilities, the positive benefits of their intelligence and dedication contribute to a range of beneficial attributes. Overall, neurodiverse individuals tend to be incredibly detail-oriented and good at process-driven work. They are typically thought of as dependable, routinized, focused, and passionate about their work (Saleh et al. 2022). Those on the spectrum can have impressive talents of enhanced perceptual functioning, high levels of concentration, targeted thought patterns and often find solutions outside of conventional options. The strengths of those specifically with ADHD include the ability to be hyper-focused, inventive, spontaneous and energetic (Fabritius, 2022). Even individuals with dyslexia have been shown to have strong spatial intelligence and entrepreneurial tendencies (Smith-Spark & Gordon, 2022). Additional positives seen with typically low-prefrontal cortex activity include spontaneity, deep curiosity and for those in the less-researched talent pool of visual thinkers, innovation and high-level geospatial abilities (Oliviero, 2008). Overall, the neurodiverse population can contribute unique skills such as creative storytelling, coding, and empathy to the workplace offices.

Technology Workforce and Neurodiversity

Despite the impressive list of highly sought-after abilities, technology firms and departments in larger companies were among the first to notice there is a socio-economic advantage, apart from competitive advantage, in proving having the neurodiverse community employed (Loiacono & Ren, 2018; Annabi & Locke, 2019). This sector will seem like a natural fit if one considers the deficits of ASD include interpersonal skills, communication and repetitive gestures, which do not hinder the required output of most software development positions, for instance. Interestingly, while there has been speculation on the natural abilities of those with ASD for programming, coding, robotics, and other quantitative, or "hard skills," as noted, studies have found that those with autism often have valuable "soft" or transferable skills. (Herrick et al. 2022). Such transferable skills include an innate lack of bias, highly developed pattern recognition and identification, systematic analysis, blunt communication style, attention to detail, and/or the ability to remain focused for prolonged periods. These specific skills are highly valued in technology fields where work is often very detailed and repetitive, and definitions of tasks avoid ambiguity (Ramnanan, 2022). Therefore, considering this portion of the population has been historically underserved in the job market, a movement in alterations of hiring practices, workplace accommodations, educational measures and empathy-based manager support must all be incorporated to help their talents thrive. Companies leading the charge with innovative neurodiverse programs include SAP, Hewlett-Packard Packard, Microsoft, Chase, USB, Ford, and IBM (Bruyère & Colella, eds., 2022). With technology culture having a history of recognizing the value of forward-thinking, innovation, and eccentric individuals, the integration of agile manifestos and use of tackboards assist with the integration of self-management tools which work well alongside the cognitive processes being discussed. One advancement includes the integration of virtual job training before on-site employment (Johnson & Williams, 2022). Noting challenges with nuance, subtlety and ambiguity, understanding performance expectations ahead of time is a recommended practice for employers working with neurodiverse personnel.

International Programs

While the best examples of programs that support Neurodiversity can be found in the technology sector, these originated outside of the United States. Early and targeted neurodiverse hiring programs included restructuring the interview process, supportive job services and job coaching, education on learning differences and manger training. Training provided to employees included soft skills, work ethics, understanding expectations, and assisting with communication. Some programs were also developed to foster staff-awareness training and better support for individual self-assessment (Weber et al. 2022). For example, the Danish consulting company Specialisterne originated such programming in 2004, inspired by the founder's motivation for his child's diagnosis and the niche of talents that align with software testing. For several years, the firm designed, developed, and implemented new non-interview methods for identifying and assessing neurodiverse employees. The program includes safe, quiet spaces for candidates

to communicate in comfort and showcase their talents. Following this interview stage of the process, candidates are provided with 2-6 more weeks of further assessment and training (Garriga, 2022).

Another example can be found in SAP, a German tech firm, who led the way in 2013 with its Autism at Work program. Considered the largest of the autism employment initiatives, the program was launched as a "resource effort seeking to quantify results of the cost benefit justification and even science of autism advantage in the workplace" (Annamalai & Niranjan, 2022, p.503). Originally the intent was considered a form of corporate social responsibility and sourced accordingly with a more generalized focus on diversity and culture, but evolved with the recruitment initiatives emphasizing the corporate economic value of employee diversity and the value of diversity to the bottom line. Also, while intended to focus on software testing placing, the discovery was an additional added sets of values in much broader range of tasks including product management, business analytics, cyber security, HR service, and technical support (Lechowski & Krzywdzinski, 2022). Motivations for such programs extend beyond the company, however. In Germany, the benefits of transitioning individuals from public assistance programs and into jobs is encouraged as tax revenue can only be generated through a working populace. Thus, positions are publicly funded to train and support neurodiverse employees (Gschwind, Ratzmann, & Beste, 2022). One example of such support can be seen in SAP's program where a transferable skills module was created to help train employees unfamiliar with working in offices. There has also been growing interest in supporting mentor programs and "buddy systems," which allows for further cognitive and emotional support.

The programmatic support offered by SAP is more typically funded by governments or nonprofits. Accordingly, regional employment regulations governing support of people with disabilities are considered (Stolman, 2022). As with other groups, these programs collect and suggest neurodivergent candidate lists and offer wraparound support from job searches to upskilling. First, services include assisting with prescreening followed by securing public funding for training (when available), and occasionally administering such training in-house, and, finally, continue to support employees through mentorship outside of office hours (Maslahati et al. 2022). One such successful example can be found in the DXC Dandelion Program created by Hewlett Packard (HP) in 2014. The program was designed using economic and statistical metrics through partnerships with Cornell Institute of Disability and Employment at La Trobe University, Melbourne, Australia (Bury et al. 2022). The program works to hire neurodiverse workers for software testing, data analytics and cyber security. The largest number of workers are placed in a software testing pod, working collaboratively and contracted out to the Australian government's Department of Human Services. Nick Wilson, Director of HPE South Pacific noted that the program has resulted in "productivity gains, quality improvement, boosts in innovation capabilities and broad increases in employee engagement" and noted that no other program in the firm provided so many benefits in all three biopsychosocial arenas. One of the most notable differences in management style where there now exists, through training and education, greater sensitivities to neurodiverse needs in the workplace (ARE Consultants, 2021).

Domestic Programs

Targeted inclusion programs have evolved from the technology sector to others. SAP, Virgin, and Microsoft are examples that led to expansion into other industries, such as finance and defense (Fabritius, 2022). For instance, Microsoft holds multiday, hands-on sessions, focusing on job capabilities, team projects, and skills assessment from software engineers and data scientist positions. Staff are trained to identify neurodiverse individuals and interact with them appropriately. Such training includes familiarization with the core deficits that often manifest including limited eye contact during interactions, repetitive gestures and movements, and difficulty understanding non-direct or non-literal language (Haller & Carroll, 2022). To facilitate these trainings, certain firms have chosen to partner with nonprofits or governmental agencies that are charged with career support for those with disabilities. As an example, Freddie Mac, the finance firm, partners with a group of neurodiverse self-advocates, the Autistic Self-Advocacy Network (ASAN) instead of another company (Patton, 2022). Ford Motor Company has partnered with the Autism Alliance of Michigan to create a program called Ford Inclusive Works (now called FordWorks).

Other programs highlight improved employee retention. Wells Fargo, for instance, boasts a 100% retention rate in their Neurodiversity Program which focuses on delivering education, professional support, and establishing meaningful employment opportunities through more accommodating and accessible hiring practices. Transforming the culture through education, the support provided by the finance firm includes hiring manager selection and education, new hire onboarding, buddy program, career coaching and community enrichment. By augmenting the firm's interview process to ensure a low-stress experience and de-prioritizing typical portfolio requirements, the program has resulted in hiring based on skills instead of social strengths in interviewing. Once hired, new employees are provided with three full weeks of concierge services during the onboarding process. Services include orientation, technical set-up support, an accommodation process and role-based training through AGILE. New workers are also paired with a mentor and/or a peer for a buddy program, provided with career coaching and community enrichment. Leadership experience is also provided as employees can lead an advisory council to oversee disability definitions and considerations for cognitive accommodations, including evaluating the work environment (Kristofik & Johnson, 2022).

Communication Preferences

The programs supporting neurodiverse workers carefully consider communication from training hiring managers to understanding diverse communication styles among employees. A discussion of best practices in such programs thus needs to be person-centered in design. For example, the best way to understand communication preferences for direct reports or colleagues, considering working processes, is to directly ask. While this holds true for all employees, management should be especially cognizant of the circumstances in which neurodiverse employees work best and clearly communicate expectations, deadlines, and outcomes. Many prefer to learn in a hands-on environment and require a step-by-step breakdown of work processes (Dawson, Franz, & Brandsen, 2022). Ambiguity can be confusing and lead to increased anxiety. Communication is often difficult for neurodiverse individuals as there is a vast wealth of socially attained knowledge not innately understood. Many intuitive, non-verbal exchanges occur during oral exchanges. Therefore, written communication is usually the preferred method for many, given differences in spoken communication processing (Elsherif et al. 2022).

Other recommendations for communication strategies in the workplace include providing processing time and visual aids. Whether informal conversations in the office or in larger departmental meetings, those conveying information should include intermittent pauses to allow for processing of information. Keep small talk brief and when able, consider offering conversational exits for neurodiverse individuals who may feel overwhelmed but do not wish to appear rude by cutting a discussion short. Neurotypical workers use workplace chat to build mutual trust, teams, understanding and connections. Neurodiverse workers, on the other hand, can find the task tiring, especially if the topic seems out of context or irrelevant. One strategy is to demonstrate relevance to the topic under discussion and seek out the communication partner's interests to keep them engaged in the conversation (Annabi & Locke, 2019).

Assistance with group communication is also recommended, including helping to interpret nonverbal or social cues for individuals in an empathetic and non-patronizing fashion. In fact, using plain language for those who struggle with the nuance of navigating work, popularity, and global culture is not just going to benefit neurodiverse individuals. The situation is even more daunting in group meetings with many participants, especially in environments with the expectation of staying still/seated. To keep focused on an agenda, avoid only communicating orally and include visual aids, being as concise as possible in speech. Bullet points or numbering important items are effective visual signposts that present information prioritized in order of importance. Send out agendas for meetings ahead of time to allow for review and processing. Provide advanced notice of meetings that will require social interaction. Unannounced meetings, video conference calls, or instant messaging can be anxiety inducing for those with ASD and ADHD (Fabritius, 2022).

Clear agendas presented ahead of time are essential for mental and emotional regulation, as well as maintaining a preset schedule during meetings. When disseminating information, make sure to give highly specific instructions. Avoid the assumption that something may be obvious, especially during socially

oriented tasks, and limit abstract or ambiguous terms. As well, avoid vague time sequences and nonconcrete statements, such as "we'll talk about this later" or "no rush, whenever you can get to it." Providing specific deadlines and accurate time phrases is essential (Herrick et al. 2022). Often it takes time to switch attention from the task being worked on to a new topic of discussion, but this can be facilitated by providing context for the work being requested via the supervisor or colleague. While most with ASD have difficulty adjusting to change, with notice and time to regulate and process, along with clear timelines and instructions, they are not inflexible to it. When corrective action is required, feedback should also be direct, but measured. As mentioned previously, RSD impacts the emotional and mental health of individuals who are already self-critical. Thus, positive reinforcement should be regular. Feedback which is sensitive, but direct with measurable examples, limits confusion and emotional inference on job performance (Whittenburg et al. 2022).

Finally, in order to minimize stress and ensure a positive work environment, being mindful of communication preferences is critical. With the pandemic of 2019 came a necessary increase in virtual communication through video conferencing platforms such as Microsoft Teams and Zoom. For many with social anxiety, the virtual situation was (and continues to be) beneficial given the potential to participate in meetings via comments and instant messaging rather than engaging verbally. Given the organic nature of in-person meetings where participants often show up to chat early and stay after to socialize, the new virtual meetings offered more structure and predictability. However, one consideration did lead to increased anxiety with the requirement to have cameras turned on for many firms (Dewi, 2022). Since communication preferences vary from person-to-person, asking if there is a preference for cameras off can alleviate social anxiety. Even prior notification of a meeting organizers' preference for cameras on or off can alleviate unknown concerns for the neurodiverse attendee. Taking breaks between (or during) calls to stem or regulate is also helpful given the difficulty in remaining seated and still for prolonged periods, whether virtually or in-person.

Summary of Communication Recommendations

- Use person-centered, individualized communication styles
- Provide step-by-step instructions
- Ask about work and communication preferences
- Give advance notice of meetings and calls
- Use literal and direct instructions
- Provide clear timelines and outcomes for projects
- Keep small talk brief
- Offer conversational exits
- Avoid abstract or ambiguous terms or language
- Use visual aids to reinforce important points
- Provide agendas for meetings ahead of time
- Make the requirement of cameras for video conferencing optional
- Provide careful and measured feedback

Physical Environmental Factors

With the required return to the physical office by most firms after the pandemic, many neurodiverse individuals found the situation disabling in current working environments. Overhead fluorescent lighting can be overwhelming and without proper acoustic protection to buffer noise pollution, sensory sensitivity can be debilitating. Sensory stimuli can be disorienting and anxiety inducing for those with ASD. Even aesthetic details, such as texture, color, sequencing, compartmentalization, temperature, and even smells can contribute to both over- and under-stimulation (Proff et al. 2022). Having environments suited to particular tasks and moods requires additional planning. Office layouts should include both shared spaces for social interaction and collaboration, along with quiet spaces for more focused work, minimizing environmental distractions. Modern cubicle farms and open floor plan often result in loud, motion heavy

atmospheres. More noticeable distractions from background conversations, sudden noises like sneezing and laughter, and specifically the smells and sounds of eating can be overwhelming. To combat noisy spaces, areas should be designed effectively to absorb sound through partition systems or with acoustic baffling to get the illusion of private space (Koohsari et al. 2022). Allowing personal space through assigned seating locations and/or private areas to pause or regain nervous system control are most important.

Layout examples should include areas designated for calm and quiet contemplation. These can include the use of low trafficked minimal sensory rooms, wellness areas or the fostering of green spaces to create a sense of safety and belonging (Kong & Cheng, 2023). Interior design which includes biophilic elements derives from the concept that humans are calmed by their natural environment (Song et al. 2022). Not only do neurodiverse individuals seek out areas which mimic outdoor spaces, but the inclusion of organic elements into office décor helps to mitigate ASD triggers and other visual distractions. Access to sunshine and natural features, such as moss walls, water features, and the use of plant life not only creates a soothing environment, but enhances the interior air quality as well. Additionally, Yijun et al. (2020) found that the inclusion of "nature with interior green spaces increases well-being up to 15% while reducing boredom and stress levels." Bright colors and natural light are found to improve productivity and creativity in employees. These adjustments not only impact the experiences of neurodiverse employees, but all who work within the company (Yijun et al. 2020).

Psychological Factors

While environmental adaptations can minimize anxiety and improve productivity, firms should consider the whole person through biopsychosocial interventions. As such, perhaps the most important support a firm may provide is creating a safe and open environment for neurodiverse individuals. Having the right environment to promote honest conversations is essential as a starting point to the disclosure of a neurological condition. A 2022 study found that 76% of neurodivergent workers do not disclose their diagnoses in the workplace as they are concerned it will impact their career trajectory (Aquino, 2022). The majority of those surveyed self-identified as dyslexic (53%) with the next largest group self-identifying as autistic (47%). Other respondents included diagnoses of dyspraxia, dyscalculia, and ADHD. Research also revealed that a majority (two-thirds of respondents) "have experienced stigma or feeling misunderstood at some point during their career" due to their condition, with a third experiencing difficulties during the interview process, and another third reporting feelings of not progressing in their careers (Aquino, 2022).

Therefore, the first step for employers is to promote a culture of acceptance where disclosure is encouraged through psychological safety. The ability of workers to understand their own strengths and challenges is difficult in the context of work, especially without initial support. A culture which values shared understanding, identity, and purpose should be nourished; one that supports the idea that diversity and challenges are potential opportunities. In the United States, access to workplace accommodations for disability is predicated on individual disclosure, and usually a result of a conflict, following episodes of criticism, or concern with reduced performance (Patterson, 2018). Often the process of disclosing a disability is publicly supported by HR and supervisors, promising compromise, understanding and flexibility, while consequences can include discrimination, workplace biases and bullying, and higher levels of stress (Doyle, 2020). Reasonable adjustments regularly focus on remediating the individual rather than integrating them properly into the corporate culture. One solution to avoid potential negative consequences of disclosure has been investigated in the UK. Instead of "special accommodations" for neurodivergent individuals who self-disclose their conditions, the UK provides "productivity enhancers" without requiring a formal diagnosis. These "enhancers" provide access to equipment and assistance (Douglas, 2008). Removing the requirement of self-advocacy for requiring assistance removes the pressure of executive functioning challenges common for those with ASD and ADHD. This strategy moves from Reactive DEI efforts to Proactive DEI and creates an empowering workplace which aids in the productivity of everyone when declaring disability status is not needed to access accommodations.

Many neurodiverse individuals find "masking" easier than risking the potential negative consequences of disclosure. There remains a stigma associated with mental health disorders in the United States. As such, there is an unconscious bias against individuals who disclose or ask for help in workplaces. These

individuals often feel questioned, challenged, or even trivialized by coworkers and supervisors (Parcesepe & Cabassa, 2013). Employers should take note of these biases as research has demonstrated that employees who feel confident to disclose their needs at work are 30% more engaged in career satisfaction, aspirations, and confidence (Henneborn, 2021). Psychological safety must first be present to share personal experiences and viewpoint without risk of retribution. For many corporations looking to help neurodiverse individuals thrive, the initial step must be to create a culture of safety, so employees are able to disclose their challenges without the fear of being labeled as disabled or lesser.

CONCLUSION

With skills shortages increasingly affecting industry, the first firms to recognize the potential of the untapped neurodiverse talent pool were in the technology sector. As ASD professionals are far more productive than their neurotypical colleagues, this has led to the establishment of programs to allow them to flourish. Whether the Israeli Defense Services or Australian Spatial Analytics, firms are confirming that Neurodiversity is a competitive advantage in industry. Though often leveraged in technical positions where stereotypes continue to pigeonhole workers with autism as quantitative or technologically talented, there is a wide range of individuals, skills and talents across the spectrum of Neurodiversity. In fact, Platzer at SAP estimates that only 15-20% of the adult autistic community has the skillsets required for the technology sector jobs seeking their employment (Annamalai & Niranjan, 2022). At the same time, such programs recognized early on a talent pool that would be ideal for user-interface positions with technical logistics. The realization and potential of utilizing this population in industry has only recently moved to other departments in firms. As noted, in studies from the University of Connecticut Center for Neurodiversity, neurodiverse individuals are highly underutilized and account for a high share of adult unemployment rates, but are eager and willing to work (Harper, 2022). To address the labor shortage and improve the quality of life for over one billion individuals globally, the narrative around Neurodiversity needs to change, along with efforts to support the population. Since Neurodiversity as a concept developed in response to the social-historical view of pathologizing weakness associated with mental health disorders, focus is now placed on an individual's diverse experiences of the world and their resulting strengths. The Neurodiversity model means accepting that brains operate, learn, and process information differently. Biological variations, such as genetics, are recognized as intrinsic to identity, and, therefore, need be assigned the same authenticity and respect as other forms of diversity. Yet, even with the increased celebration of diversity and inclusion efforts in industry, calls to incorporate neurodiverse support have failed to muster the same support outside of the technology sector. Considering many of the traits which manifest among neurodivergent employees, such as creativity, imagination, and innovation, are qualities sought out in every industry, the unilateral approach to Neurodiversity needs to give way to broader implementation of programs to bolster their talents and unique thinking abilities.

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