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The Double-edged Sword of Autism in Work Teams

by

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Abstract

Autistic workers are often drawn to science, technology, engineering, arts, and math-related fields that rely on teamwork to produce innovative solutions. Yet, autistic traits like interpersonal communication and interaction differences can make teamwork challenging. Scientists and practitioners alike have not identified the unique needs of neurodiverse teams comprised of autistic and non-autistic members. A scoping review of 29 studies dispersed through psychology, vocational training, education, management, and disability journals revealed several themes: neurodiverse teamwork is an understudied yet extant phenomenon; the ‘autism advantage’ is lauded as a benefit to organizations but ignores the health and wellness cost to the individual; interpersonal communication is a challenge that is the responsibility of all team members; the effects of disclosure are complex; coworkers, leaders, and the organization have a role to play in neuroinclusivity. Theoretical and practical implications are described, and future research directions are identified.

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Introduction

Organizations are facing increasing pressure to meet the evolving needs of their employees in a rapidly changing world. Science, technology, engineering, arts, and math (STEAM) fields look to high-performing teams for innovative solutions. These high-performing teams are often responsible for developing innovative solutions in response to emerging needs, such as machine learning tools like ChatGPT, critical health infrastructure design, or gene-editing technology. Such teams are becoming more demographically diverse (e.g., gender, race, age) and neurodevelopmentally diverse (e.g., autism spectrum disorder). Specifically, STEAM disciplines attract more individuals with autism spectrum disorder (“autism”) than any other discipline (Annabi et al., 2017). Indeed, leaders in Silicon Valley also speculate that their organizations have a higher-than-average representation of autistic individuals (e.g., “the Silicon Valley Phenomenon”; Baron-Cohen, 2000; Loiacono & Ren, 2018). Neurodiverse teams with autistic and non-autistic members will be more commonplace as the population of autistic individuals reaching a working age is expected to grow rapidly (230%) over the next ten years (Loiacono & Ren, 2018). Yet, organizations and leaders are not equipped to support autistic employees in their team settings. Referred to as “Generation A” (Johnson & Williams, 2022), they are expected to face considerable barriers to meaningful work opportunities, including effective and positive teamwork experiences.

Several prominent organizations have adopted recruitment and retention programs specifically addressing the staggering 90% unemployment rate among autistic individuals (Howlin et al., 2004). For instance, companies such as SAP, Microsoft, Hewlett Packard Enterprise, Ford, and EY have tailored assessment and training processes to tap into the perceived competitive advantage of autistic individuals, such as above-average attention to

detail and goal commitment (Kapp et al., 2013). Yet, there is considerable work to be done by corporations on the inclusivity of neurodiverse individuals—recruitment and retention of autistic workers is only one aspect of their work experiences (Timko, 2022). Little to no attention has been given to successfully employed autistic individuals in their existing work contexts, particularly team settings. Indeed, teamwork is an unavoidable and crucial part of STEAM careers—teamwork can be challenging to navigate for any team member, but this is especially salient for autistic team members.

According to the American Psychiatric Association (2013), autistic individuals have differences in social communication and interaction, as well as repetitive and restrictive interests and behaviours. In work contexts, autistic workers have unique strengths well suited to high-performing teams, such as pattern recognition and reliability (Lorenz & Heinitz, 2014). In contrast, teamwork, coordination, and communication skills were identified as the top challenges (Annabi et al., 2017; Annabi & Locke, 2019; Richards, 2012). However, an absence of research on autism in work teams suggests a limited understanding of what is needed to support neurodiverse team functioning. For instance, there is an underlying assumption in teams literature that all team members have similar social communication skills and ignore neurodevelopmental differences like autism, despite the estimated proportion of autistic workers drawn to team-based work environments typically found in STEAM. Similarly, the body of research on autism and vocational training focuses on a deficit of skills rather than the strengths they bring to the workplace.

Additionally, the literature overlooks the need for teamwork training to support autistic individuals *and* non-autistic team members and leaders. In organizational behaviour and psychology, efforts have focused on recruitment and retention, disclosure, and employment

programs (e.g., accommodations) to support autistic employees. Unfortunately, none of these areas reveal insight into how teams and leaders can effectively help effective neurodiverse teamwork. This scoping review thus seeks to integrate findings from disparate disciplines to identify themes related to autism in work teams and identify theoretical and practical implications and future research directions.

I begin by outlining background information on the characteristics of autism and how different models of disability advance or impair the inclusivity of autism in the workplace. Next, I discuss employment outcomes for the autistic population and underscore the lack of representation in the workplace. The literature on teamwork is then summarized as it pertains to neurodiverse teams and is followed by a summary of neurodiversity as the next frontier in organizational diversity.

Background Information

The term *neurodiversity* dates to the late 1990s and was coined by Judy Singer, an autistic sociologist (Milton et al., 2020). Since its inception, the term has evolved to include developmental differences like attention deficit hyperactivity disorder (ADHD), dyslexia, dyspraxia, dyscalculia, and Down's syndrome (Weber et al., 2022; Gregory & Courtney, 2023). While the terms *autism* and *neurodiversity* are used interchangeably in the present scoping review, I focus on autism because of its prevalence in STEM teams. Characteristics of autism have implications specific to STEAM work and may not be generalizable to other developmental conditions. The following sections describe autistic characteristics and models of disability pertinent to the workplace.

Characteristics of Autism

Autism is a neurodevelopmental condition that is characterized by (1) differences in social communication and interpersonal interactions, (2) restrictive interests, and (3) repetitive behaviours (American Psychiatric Association, 2013). Differences in social communication and interpersonal interaction include avoiding eye contact with others, difficulty interpreting non-verbal cues, and literal interpretations of what is said (e.g., misinterpreting sarcasm or figures of speech). There may be challenges in understanding informal norms in social contexts, such as using appropriate tone for different contexts or turn-taking in a conversation. Additionally, perspective-taking can be challenging and require considerably more effort compared to non-autistic individuals, as is the case with empathizing with others, understanding their intentions, and not taking things personally (Hedley et al., 2018). Differences in theory of mind (e.g., Scheeren et al., 2013) can provide a framework for understanding these differences in social communication. Theory of mind refers to the ability to understand the beliefs, intentions, emotions, actions, and behaviours of others and of oneself (Jacob et al., 2015). Thus, individuals may struggle to pick up on others' intended meanings when those intentions are not explicitly stated.

Repetitive behaviours are self-stimulating behaviours ("stimming") used to cope with high states of arousal (Turner, 1999). Historically, These behaviors have been categorized into (a) low-level and (b) high-level behaviours. Low-level behaviours are repetitive movements, such as fidgeting with objects, stereotyped movements (e.g., rhythmic body rocking, eye-rolling, hand flapping; (Gal et al., 2002), motor or vocal tics, and uncontrolled movements. Higher-level behaviours, such as insisting on sameness and keeping a rigid schedule, are more complex. In this latter category of repetitive behaviours, the insistence on sameness has been linked to

intolerance of uncertainty and anxiety. Among autistic adults, intolerance of uncertainty was a significant mediator between anxiety and insistence on sameness (Hwang et al., 2020). Significantly, the presentation of traits differs across individuals, and many individuals camouflage or conceal tics and other repetitive behaviours, also referred to as masking (Radulski, 2022).

Models of Disability

There is much debate about whether autism should be considered a disability. Indeed, this is an important consideration because the term *disability* has multiple meanings (e.g., motor, sensory, learning) and implications—the language used to describe people with disabilities influence others’ attitudes, thoughts, and behaviours towards them (Hagel & Hodge, 2016). By subsuming autism under the umbrella of disability, autistic individuals and their caregivers can access school or work accommodations and support services. On the other hand, categorizing autism as a disability dehumanizes autistic individuals in a way that denies basic respect and dignity (Kapp, 2019). Nevertheless, autism research falls under two categories of disability discourse: (1) the medical model and (2) the social model. It is a valuable exercise to understand this theoretical backdrop as a factor that shapes the current state of research and organizational initiatives supporting autistic workers.

Until recently, autism research has primarily been undertaken through the deficit-based *medical model* of disability. This approach views autism as a medical phenomenon resulting from a neurological deficiency. Under the medical model, healthcare practitioners and researchers focus on deviations in behaviour from what is considered normal. To access support or treatment, the individual must be diagnosed by a healthcare professional. Moreover, interventions are designed to “fix” autistic traits and are centered on medical interventions, such

as medication and therapy. The autistic individual is perceived as “faulty” and requires intervention to become normalized (Hagel & Hodge, 2016).

In contrast to the medical model, social models of disability discourse view disabilities as an individual *difference* rather than a deficit. Disability is examined as a social construct whereby the individual is not perceived as “faulty.” Furthermore, an individual’s experience of disability is accepted as a valid account, so self-identification of autism, for instance, is seen as an acceptable alternative to a medical diagnosis.

Employment and Training

Unemployment and Underemployment.

Autistic individuals can offer deep expertise and specialized skills to organizations, yet they remain underrepresented and underemployed (Burke et al., 2010; (Hendricks, 2010). This problem is reflected in a staggeringly low labour participation rate (i.e., the proportion of the working-age population employed or seeking employment). The autistic population has one of the lowest participation rates. In Western countries, this figure is estimated at 34%, compared to all groups with disabilities (54%) and groups without disabilities (83%) (Scott et al., 2015). This dismal employment outcome will only be magnified with the projected growth of the autistic population reaching the age of employment in the next ten years (Johnson & Williams, 2022). Despite math, memory, art, cognitive, and spatial abilities, the opportunity for meaningful employment is limited (Hillier et al., 2007; Hedley et al., 2017).

Even among those who are employed, underemployment is a common issue. Underemployment is defined as part-time work, full-time work without a living wage, or a role that does not match one’s training and work experience (Ohl et al., 2017). Examples include positions in customer service, entry-level administration, and food services despite graduate-

level and professional training (Muller et al., 2003). One study examined the employment activities and experiences of autistic adults and found that 46% of 130 participants were underemployed, and 32% of underemployed were women (Baldwin & Costley, 2016). Similarly, a study by Griffiths et al. (2011) revealed that many participants reported having several short-term jobs over the years. Notably, the effects of unemployment and underemployment are similar as they can be understood as part of the same continuum and negatively affect an individual's psychological and physical well-being (Dooley, 2003). Indeed, unemployment has been linked to detrimental outcomes such as increased risk of chronic disease, depression, and health problems that interfere with daily activities (Friedland & Price, 2003).

Supporting Employment Skills

Some scholars suggest the barrier to employment is attributed to impairments in social communication, an essential requirement for effective work performance (Hendricks, 2010). However, this deficits-based perspective provides only a narrow view of the broader challenge that autistic candidates and employees face. One barrier to effective support is the diverse needs across individuals (Griffith et al., 2012). Each individual has unique experiences and needs that cannot be easily addressed. For instance, one individual described themselves as “on the high-functioning end” (p. 105) of the autism spectrum, and they “fall through the gaps” (p.105) of mainstream health and social support systems because they do not have specific learning disability or mental health needs that need addressing. While these services are not part of workplace programs, this issue highlights the challenges autistic individuals face, even when accessing services intended for them.

Unfortunately, even interventions explicitly designed to support employment skills are not effective. A scoping review by Scott and colleagues (2019) examined such interventions and

found that most interventions focused on altering autistic traits without considering contextual factors like the work environment or supervisory support. These impairment-focused interventions targeted executive functioning skills like problem-solving and task management or social communication skills for interviews and workplace interactions. While the interventions (Warr & Inceoglu, 2012) improved the targeted skills, employment rates did not improve among participants. In a study by Wehman et al. (2014), 21 out of 24 (87.5%) autistic students in high school who participated in an intensive work-to-school program (e.g., Project SEARCH; Rutkowski et al., 2006) found employment, compared to only 1 out of 16 students (6.25%) who did not participate in the program. This effect persisted three months after the program. Project SEARCH required students to participate in a nine-month internship at a hospital and involved the participants' family members, local education agency, community rehabilitation program, state vocational rehabilitation program, and the business itself. The job skills participants were trained on included using public transportation to and from work, calling in sick, receiving feedback, requesting support, and getting around the work site. Although Project SEARCH was designed for high-school-aged individuals and thus is not appropriate for working-age STEAM professionals (e.g., scientists, academics, programmers, architects, etc.), the intervention does elucidate the importance of involving multiple parties to support the success of autistic individuals. A study by Schall (2010) identified positive behavioural support to implement "socially valid behaviour" (p.109). Again, such intervention takes a deficit-based view of the autistic individual as requiring behavioural changes without consideration of the broader context in which they work (Scott et al., 2019). Unfortunately, existing workplace interventions that focus on individual's autistic traits do not effectively support their individual needs.

STEM Training

Compared to the general population and other disability categories (e.g., Wei et al., 2013), autistic young adults are more likely to choose a major in STEM in post-secondary studies. Those enrolled in a two-year STEM program in college were more likely to transfer to a four-year university program than those who chose a non-STEM field. Compared to non-STEM majors, STEM students were more likely to remain in their program. Baron-Cohen and colleagues (2009) hypothesized that this interest in STEM-related subjects is attributed to a desire to create a rule-based system.

A factor analysis of autism-related job characteristics was conducted from O*NET, the US Department of Labor's job description database (Kaupins, 2022). Six job characteristics related to autism were identified and correlated with a pre-existing recommendation list of 51 jobs (e.g., Grandin, 1999): (1) physical coordination, (2) awareness, (3) social orientation, (4) innovative ideas, (5) numerical orientation, and (6) accuracy. The correlation analyses did not reveal an ideal career list for autistic workers, and the best options depended on an individual's strength(s). For instance, poetry or creative writing was well aligned with high scores in innovative ideas but unsuitable for someone ranked high in numerical orientation. Likewise, statistics was well suited for someone high in numerical orientation but not high in social orientation. Importantly, these results highlight a need to recognize the diversity among autistic individuals and that autism alone does not define an individual's job competencies. Overall, the results indicated they may prefer jobs not high in social orientation. Yet, workplaces are "inherently a social place" (p.31, Bhuiyab et al., 2022), mainly when teamwork is a core part of the job. Indeed, teamwork is ubiquitous and perceived as an essential skill in engineering, sciences, and computer science (McDaniel & Salas, 2018; Lingard & Barkataki, 2011; Oladiran et al., 2011) as well as

performing arts, architecture, or graphic design (Gaunt & Treacy, 2020; Tucker & Abbasi, 2015; Tarricone & Luca, 2022).

An important factor that affects employment outcomes among the autistic population is an appropriate person-job fit. This refers to an alignment between a person's abilities (e.g., experience, education, knowledge, skills) and the requirements of the individual and job characteristics. When there is alignment, employees enjoy higher levels of job satisfaction, motivation, and performance and lower levels of job-related stress (Edwards, 1991). Working in teams is an inevitable part of these careers, which can create challenges for autistic individuals with differences in social interactions.

Teamwork

Neurodiversity in Teams

Neurodiversity has not been examined in work teams. Scholars have looked at individual attributes and skills in student teams related to education (e.g., White et al., 2017), vocational training to support employment (e.g., Seaman & Cannella-Malone, 2016; Nicholas et al., 2015), and strengths and challenges related to person-job fit (Annabi et al., 2017). Yet, these studies have not been extended to team settings in the workplace. The complete absence of reflections on neurodiverse teamwork perhaps reflects an assumption that it is uncommon for autistic people to work in teams. Yet, a longitudinal study in the U.S. revealed that autistic students tend to choose STEM majors over non-STEM majors (Wei et al., 2014). This finding is also underscored by anecdotal evidence among autistic individuals (i.e., scientist and advocate Temple Grandin; Grandin & Panek, 2013) and technology leaders in Silicon Valley, the centre for technological innovation (Baron-Cohen, 2008; Silberman, 2017).

On a broader scale, literature on team diversity has primarily examined the relationship between ‘deep’-level diversity and team performance. Scholars have used the term deep-level diversity about psychological variables like personality, attitudes, values (Harrison et al., 2002; Kilduff et al., 2000), as well as informational diversity, or differences in knowledge and perspective (Jehn et al., 1999). Further, deep-level diversity subsumes *cognitive diversity*, which has solicited a multitude of definitions, such as differences in cognitive processes (Kurtzberg, 2005), variations in knowledge skills, education, and natural ability (Martins et al., 2013; Mello & Rentsch, 2015). Thus, studies on deep-level diversity may shed light on neurodiverse teams, which are also comprised of diversity in cognitive processing.

Diversity studies and management initiatives in the workplace have been championed as a catalyst to performance, mediated by creativity and innovation, problem-solving, and decision-making (van Knippenberg et al., 2020). Diversity has been linked to performance at the team level, but this relationship with team effectiveness is mixed. For instance, Wang et al. (2019) assessed the relationship between diversity and innovation. They found that deep-level diversity but not “surface”-level diversity (i.e., demographic traits like age, gender, and culture) was positively associated with innovation in collocated teams working on complex and interdependent tasks (Harrison et al., 1998). In another study, Shin et al. (2012) also found that cognitive team diversity was related to individual members’ creativity, moderated by leadership style and individual self-efficacy. Lau, Beckman, and Agogino (2012) found that student teams with diverse learning styles performed better than those with homogenous learning styles. A similar effect was recovered in student dyads working on a case analysis assignment (Sandmire & Boyce, 2004). In a study by Pieterse, van Knippenberg, and van Ginkel (2011), cognitive diversity hurt team performance; however, team reflexivity (i.e., collective reflection and

adapting work methods) mitigated this adverse effect. Furthermore, while high cognitive ability members shared more accurate and similar mental models (e.g., Edwards et al., 2006), other findings indicate no relationship between cognitive diversity and team performance (Devine & Philips, 2001). These mixed findings on how cognitive differences relate to team functioning suggest that more investigation is needed to understand this relationship.

Historically, research on work teams assumed that team processes are homogenous—that team members have the same experiences and level of participation (Ilgen et al., 2005; Mathieu et al., 2008; Mathieu et al., 2014; van Knippenberg & Mell, 2016). This assumption of homogeneity suggests that team composition does not affect team processes and performance. Similarly, emergent states are conceptualized as shared cognition or affect in a team, and this sharedness influences team decisions and behaviour (van Knippenberg & Mell, 2016). However, this notion of sameness in teams has been recently challenged (e.g., van Knippenberg & Mell, 2016). Teams in the knowledge economy, including STEM domains, benefit from having diverse team members—in such cases, team diversity is thought to positively affect team performance (van Knippenberg & Mell, 2016). Importantly, the effects of team diversity on performance are not automatic. Teams require sufficient effort and time to stimulate divergent ideas to benefit from their diverse composition.

Teamwork

Teamwork has been examined through various theories built on Trist and Bamforth's (1951) formative sociotechnical theory that identified groups as a unit of analysis. Steiner's (1972) classic theory on process loss posited that teams do not reach their potential because of difficulties that emerge from factors like degree of task interdependency or decreasing motivation. McGrath (1984; 1991) conceptualized team task types and the overall complexity of

teamwork into a theory of time, interaction, and performance, whereby teams have multiple goals simultaneously that affect their performance. Hackman (1987) advanced a model of team effectiveness that suggests teams assess their performance in real-time, which affects team processes and performance. Much of the teams research is now predicated on the input-process-output (I-P-O) model and its variations (Marks et al., 2001). The following sections elaborate on the model's processes, emergent states, and inputs and outputs.

Team Processes and Emergent States. Teams require cognitive, verbal, and behavioural actions between team members to progress towards and achieve a common goal (Marks et al., 2001). These activities are known as *team processes* and are the underlying mechanism of teamwork that transforms inputs (e.g., personnel, money, time) into outputs (e.g., quality of product, sales, customer satisfaction; Gladstein, 1984; Hackman & Morris, 1975; McGrath, 1986). Team processes are often a 'black box', and as such, much of teams research focuses on identifying and understanding the mediating processes that impact team effectiveness. Marks et al. (2001) deepened the I-P-O model by advancing a temporally based model of team processes and taxonomy of team process dimensions, foundational to current approaches to team science. Their taxonomy identifies three categories of temporally based processes: (1) transition, (2) action, and (3) interpersonal phase processes. Specific team processes are identified as occurring during either transition or action phases, while interpersonal processes occur during action and transition phases; transition phase processes include planning, strategy formulation, and goal prioritization. During transition periods, teams assess their current state and past performance to determine the adjustments required in activities to accomplish a shared goal. Processes during action phases include progress monitoring, resourcing, providing feedback, and coordinating task sequences and timing. Lastly, interpersonal processes occur throughout

teamwork, including conflict management, motivation, and emotional regulation. Marks et al.'s framework endeavors to capture the temporal nature of teams working on multiple tasks and projects simultaneously by modeling the 'rhythm' of recurring tasks and action phases of concurrent tasks.

In STEM sectors, it is common for teams (e.g., project, production, and service teams; Marks et al., 2001) to work simultaneously on multiple projects and goals, and even across disciplines and organizations (Mathieu et al., 2002). Therefore, a team's underlying processes and emergent states tend to be dynamic as teams move between planning (transition phase) and implementation (action phase) activities. Yet, the model does not explicitly convey the level of processing and communication needed to coordinate and monitor within and between tasks. While related, coordination and communication processes are distinct. That is, coordination requires the synchronization of individual team member actions, while communication initiates or sustains taskwork through information sharing and team member interactions (Glickman et al., 1987; Morgan et al., 1993; Kozlowski & Ilgen, 2006). This distinction is vital because I-P-O models typically focus on team coordination processes under the assumption that individual members of the team have similar communication skills and abilities. During action phases, communication is particularly crucial to prevent confusion and conflict (Marks et al., 2001).

In contrast to team processes, *emergent states*, or "cognitive, motivational, and affective states" (p.357), shape interaction among team members (Marks et al., 2001). These collective psychological states surface from repeated, habituated, and routinized interactions between team members and are shared across team members (Mathieu et al., 2008). Examples of emergent states include team cohesion, shared mental models, and team norms. Specifically, in teams with accurate shared mental models, members have the same understanding of describing, explaining,

and predicting events in their team. Importantly, shared mental models (Mathieu et al., 2000) can facilitate team effectiveness by limiting the amount of communication and processing needed during action processes requiring coordination (Converse et al., 1993).

Team Inputs and Outputs. The inputs of teamwork garnered attention in the past when researchers focused primarily on team performance outcomes and included composition, team-level factors, or incentive structures (e.g., Ilgen et al., 2005). More recently, diversity has been examined at the team level as an input variable. Team diversity is elaborated on in the following section. Outputs of team processes are typically measured as dimensions of team performance. Performance indicators may be objective (e.g., sales volume, profit, accuracy) or subjective (e.g., client satisfaction, performance evaluation by others) (Horwitz, 2005; Mesmer-Magnus & DeChurch, 2009).

The Neurodiversity Movement: A New Frontier

Some organizations, particularly in the technology sector, have taken meaningful strides to tailor employment and training programs to autistic individuals. In 2004, the Danish consulting firm Specialisterne catalyzed a shift towards equity and inclusivity for autistic job candidates by using non-interview methods. Similarly, Aspiritech, an American not-for-profit organization founded in 2008, employs and trains autistic individuals in software and quality assurance testing (Mottron, 2011). Several companies have followed suit, including SAP, Microsoft, Hewlett-Packard Enterprise, Ford, and EY (Kapp et al., 2013; Annabi et al., 2017). Specifically, these companies have focused on reducing barriers for autistic people during recruitment processes by removing interviews as a selection tool. In a study by Nicholas et al., autistic candidates were less likely (30%) to be invited back for a second interview compared to neurotypical individuals (75%). Indeed, the interview process is a systemic disadvantage as it induces higher stress levels

and cognitive effort, making it difficult to make eye contact and make small talk (Loiacono & Ren, 2018). Interviewers also tend to rely on subjective perceptions of candidates and hold job-irrelevant biases that form their decisions (Morgeson et al., 2005). Thus, removing interviews as a necessary step in recruiting and selection processes is an essential move by organizations that signify an understanding and acceptance of autistic individuals.

The study of diversity in organizations and teams is at a critical juncture (Nkomo et al., 2019). The current backdrop of the sociopolitical climate characterized by populist movements juxtaposed with the “Me Too” and “Black Lives Matter” movements, coupled with global shifts in a post-pandemic world, creates an unfamiliar context for diversity. Since its inception fifty years earlier, the trajectory of diversity literature has shifted every 20 years or so. Initially, literature focused on anti-discrimination and equal opportunity (e.g., Bartol, 1978; Cox & Nkomo, 1986; Thomas & Alderfer, 1989), then shifted towards a business case stance supporting diversity during the 2000s. Since 2010, diversity management practices have turned to inclusion and promoting a diversity climate. Whereas diversity studies initially focused on racialized groups and women in management, scholars are now attending to the notion of “*individualized experiences* of belonging to *multiplex, fluid categories* (Nkomo et al., 2019, p. 500). One such example is neurodiversity, considered one of the next frontiers of diversity studies.

The neurodiversity movement is simultaneously a concept and a civil rights movement (Griffin & Pollak, 2009). It represents ‘fluid categories’ (e.g., Nkomo et al., 2019) in rejecting the medical model and reframes neurological conditions as normal developments or naturally occurring differences. Before the neurodiversity movement, autism was primarily examined in the fields of early childhood development, clinical psychology, medicine, education, and vocational rehabilitation, and much of the extant literature uses a medical or deficit model

to understand the needs of autistic individuals. Specifically, studies examined deficits in perspective-taking (Baron-Cohen et al., 1997), slower processing speeds (Haigh et al., 2018), and emotional perception and regulation (Mazefsky et al., 2013; Haigh et al., 2018). Although rampant in literature, understanding autism through a deficit lens can lead to dehumanization that denies basic respect and dignity (Kapp, 2019). The neurodiversity movement emerged in the 1990s as an online, grassroots initiative by autistic people in rejection of this medical model and has since grown to include a multitude of neurological conditions like attention deficit disorder, dyslexia, dyspraxia, Tourette syndrome (e.g., Krzeminska et al., 2019; Ortega, 2009; Brinzea, 2019).

Further, the movement seeks to reduce the stigmatization of neurological differences by emphasizing the rights and uniqueness of individual experiences. Autism is complex and multifaceted, and any person's experience is unique. This diversity *within* neurodiversity is significant in autism, as described by Dr. Stephen Shore, an autistic scholar, and professor of special education, “if you’ve met one person with autism, you’ve met one person with autism.” The importance of acknowledging individual experiences and knowledge as the sociological theory of standpoint epistemology also supports expertise. This theory posits that knowledge is socially situated and the direct experience of a condition gains oneself authority on that knowledge (Russell, 2020). Additionally, when autistic individuals belong to other minoritized groups, the intersection of those identities (e.g., autistic women, autistic visible minorities, etc.) create even more complex challenges, such as seemingly low-grade, uncivil behaviour from coworkers (Cortina et al., 2013, Cortina, 2008).

The Present Study: A Scoping Review of Autism in Work Teams

Research on deep-level diversity in teamwork suggests that teams may benefit from a neurodiverse composition through innovation. Yet, it remains unclear what team leaders and coworkers can do to support autistic coworkers readily. The differences in social communication and interaction are particularly important, the backbone of teamwork. However, the extant literature has yet to examine this form of teamwork. The present scoping review thus examines literature from diverse domains such as disability studies, vocational training, education, psychology, organizational behaviour, and leadership to explore the following research questions: (1) What are the experiences of autistic individuals working in high-performing teams? (2) How do neurodiverse teams compare to neurotypical teams? (3) What do leaders, team members, and autistic individuals need to know about working in neurodiverse teams? The present study will summarize the current state of research and identify research directions.

Methods

The scoping review was conducted in accordance with a framework developed by Arksey & O'Malley, (2005) and advanced by Levac et al., (2010). The framework includes six stages: (1) identify the research question, (2) search for and identify relevant studies, (3) select the studies for review, (4) chart the data, (5) collate, summarize, and report the results, and (6) consult with stakeholders to inform the findings.

Search Strategy

In line with scoping search strategies, multiple sources were used to promote a broad literature search (Levac et al., 2010). The following databases were searched: PsychINFO, Web of Science, EMBASE, and Scopus. Restrictions were not set on publication dates and ranged

from 2004 to April 2023. A search of reference lists also yielded critical studies, reviews, and conference proceedings. Search terms were used based on population, age, and domain (Table 1).

Table 1

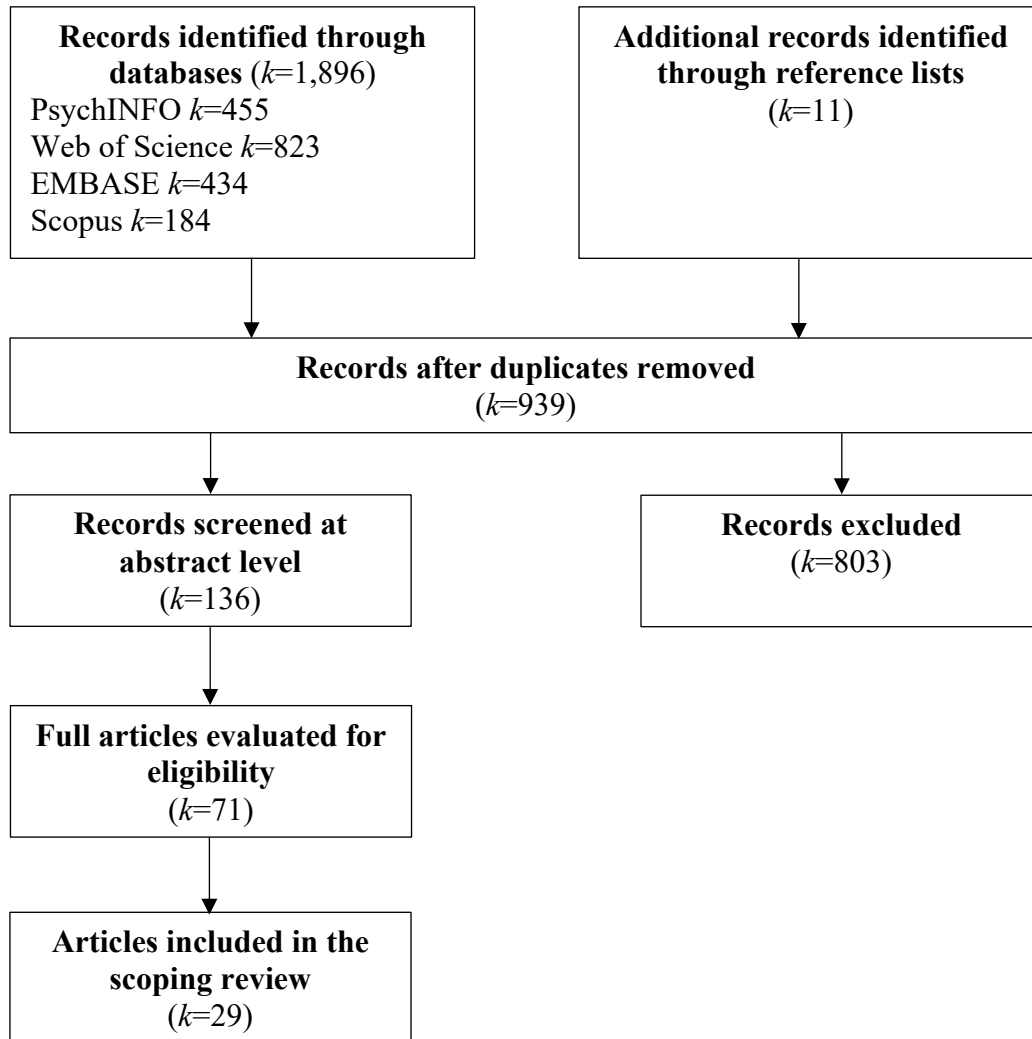
Search Terms Used In Database Searches

Population	Age	Domain
autis*, ASD, autism spectrum disorder, asperger*	not child*, youth	team*, employ*, work*, job, management* intern*

*These search terms were truncated and exploded

Study Selection

An iterative process was used in the scoping review, whereby the study inclusion criteria were refined as I became more familiar with the literature (Arksey & O'Malley, 2005; Levac et al., 2010). The domain terms were initially restricted to work teams in science, technology, engineering, arts, and math sectors (e.g., high performing teams), but this resulted in only three studies that indirectly related to teamwork (Lorenz & Heinitz, 2014; Morris et al., 2015; Remington & Pellicano, 2019). Thus, a decision was made to expand the domains to a broader scope that included student teams and any sector. Articles were selected and included in a spreadsheet if: (1) participants were autistic without an intellectual disability and were adults or post-secondary students; (2) described teamwork in workplaces, internships, or student projects; and (3) described interpersonal or communication experiences in workplace settings. Articles were excluded if they did not meet the inclusion criteria.

Figure 1*Flow chart of study selection.*

Charting the Data

The selected articles were reviewed in full and descriptive characteristics of the articles were logged into the spreadsheet, including: author, year, keywords, study design, participant characteristics, study objectives, outcome measures, findings, and quality and level of evidence.

Assessing Methodological Quality

The methodological *quality* of each article was assessed using the Standard Quality Assessment Criteria for Evaluating Primary Research Papers from a Variety of Fields (Kmet et al., 2004). There is a checklist of ten items for qualitative studies and 14 items for quantitative studies. An article receives a score of two if it meets the criteria, a score of one if it partially meets the criteria, and a score of zero if it does not meet the criteria. The total scores are then represented as follows: >80% (strong), 70%-80% (good), 50%-70% (adequate), or <50% (limited).

The articles were also assessed for *level of evidence* for effectiveness based on the guidelines developed by the Joanna Briggs Institute (The Joanna Briggs Institute, 2014). There are five levels: (I) experimental designs, (II) quasi-experimental designs, (III) observational-analytics design, (IV) observational-descriptive studies, and (V) expert opinion and bench research.

Collating, Summarizing, and Reporting the Results

The articles were first analyzed on their descriptive characteristics. Next, the content of the articles were analyzed to identify broad themes of each study, in line with Arksey and O'Malley's framework (2005). Examples of broad themes included communication, disclosure, strengths, and challenges. The articles were further reviewed, and nine themes were identified.

Consulting With Stakeholders

Consultation with stakeholders is considered an optional part of the scoping review process (e.g., Arksey & O'Malley, 2005; Levac et al., 2010) but was integrated into the present study in line with participatory action research (Baum & MacDougall, 2006).

The objective of the consultation was (a) to co-create knowledge by integrating autistic lived experiences with findings of the scoping review, and (b) to strengthen the researcher-stakeholder relationship recognizing a shared interest in social change (e.g., McIntyre, 2007).

I obtained feedback from members of the autistic community on the preliminary findings of the scoping review. Their perspectives were included in the scoping review themes, whether their views converged or diverged with the findings, and specific examples were included to highlight their experiences.

Perspectives on teamwork in addition to the article's findings. Responses from stakeholders were incorporated throughout the results section.

To participate in the consultation, individuals were required to have a diagnosis *or* self-identified as autistic, and have three or more months' work experience in a team environment related to science, technology, arts, engineering, or math. To access this population, I used a purposive sampling approach to identify potential participants likely to provide pertinent information for this study (Lincoln & Guba, 1985). Individuals who expressed interest were sent a link to the study, which included the consent form and indicated participation was voluntary. A total of 42 individuals participated in the survey, but eight participant responses were removed from the data set because they did not meet the inclusion criteria, ten individuals did not

complete the survey, and one individual did not consent to participate. A final count of 23 stakeholder responses was included in the data set, and included 13 females, eight males, one gender-fluid woman, and one non-binary individual. Most participants were white (17), followed by south Asian (2), black (1), middle eastern (1), southeast Asian (1), and east Asian (2).

Stakeholders were recruited through several approaches. First, advertisements were posted with the Asperger/Autism Network (AANE) in the United States, Autism Canada, Autism Ontario, the Autism Science Foundation, as well as the University of Calgary's community research participation website. Secondly, advertisements were posted to professional association pages on LinkedIn, and included engineering, IT, project management, and architecture associations in North America. Third, participants were recruited through social media platforms. snowball sampling was also employed, and stakeholders were encouraged to share this study with other individuals who were eligible.

Stakeholders completed a 30-minute survey that contained 42 questions rated on a Likert-type scale of 1 to 5, and 6 open-ended questions (see Appendix A). They were asked to respond as subject matter experts and evaluate the extent to which they agreed or disagreed with the research findings. They also gave written feedback on open-ended survey items.

Results

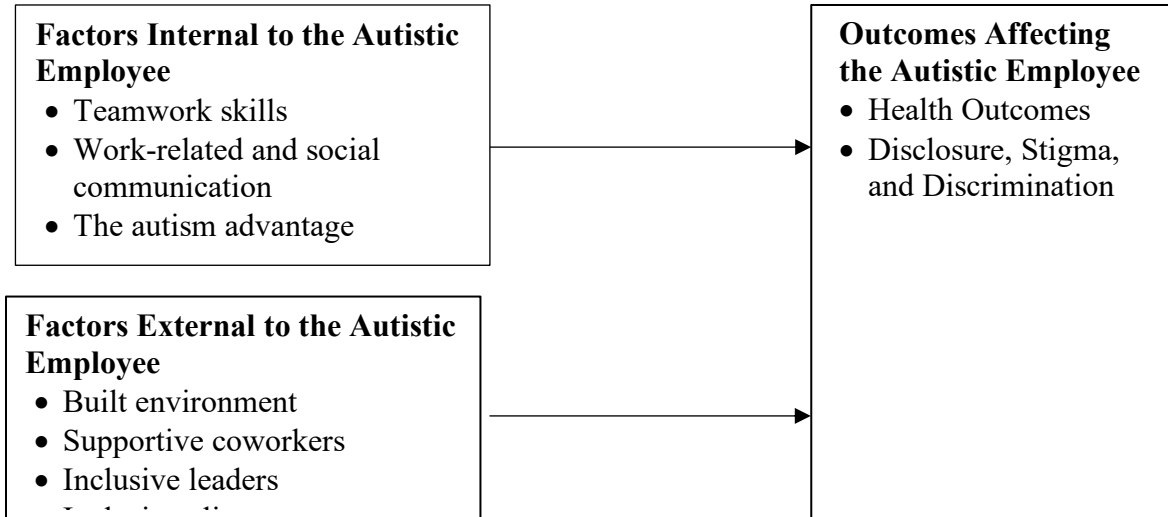
Study Characteristics

The methodological quality of the selected articles was assessed (Knet et al., 2004), and the 29 studies ranged from strong ($k=8$), good ($k=7$), adequate ($k=5$), and limited ($k=9$) (see Appendix B for descriptions of the studies reviewed). The articles were also assessed for level of evidence according to the JBI hierarchy of scientific evidence: (I) experimental designs, (II) quasi-experimental designs, (III) observational-analytics design, (IV) observational-descriptive studies, and (V) expert opinion and bench research. About half of the articles ($k=16$) were evaluated as level III and included short-answer survey studies, semi-structured interviews, case studies, focus groups, and systematic reviews of observational studies. Level V, or an expert opinion or bench studies ($k=8$), included editorials, opinion articles, commentaries, and conceptual frameworks. The remaining articles were categorized as Level II ($k=6$) and included survey-based studies that were quantitatively analyzed; interview studies analyzed using Q-methodology, and a structured narrative literature review. Limitations of the studies included unstructured literature reviews, vague study contexts, limited systematic data analysis, and weak linkages to existing theory (see Appendix C).

Various themes emerged from the scoping review across the articles and have been categorized into internal factors, external factors, and outcomes (see Figure 1).

Figure 2

Conceptual Representation of Scoping Review Themes



Teamwork Skills

Teamwork skills were identified as a challenge. Lorenz and Heinitz (2014) asked 136 autistic individuals to rate their top five strengths among 26 attributes; not one participant identified teamwork as a strength. Others among the bottom five attributes included flexibility (4%), social skills (4%), multitasking (1%), and empathy (1%). Responses from community stakeholders were not as clear cut, with mixed reactions to the item *I enjoy working on team projects* (Appendix C: Q23b - 34.78% strongly or somewhat agreed; 39.13% neutral; 26.09% strongly or somewhat disagreed). In contrast, stakeholders did endorse several teamwork-related items, including *understanding and navigating communication networks* (Q23b – 81.82% strongly or somewhat agreed); *communicating openly and directly* (Q23c – 90.91% strongly or somewhat agree); *listening actively and without judgment* (Q23d – 95.45% strongly or somewhat agree); and *ensuring nonverbal and verbal messages are the same and recognize and interpret the nonverbal messages of others* (Q23e – 81.82% strongly or somewhat agree).

Two studies identified conflict management as challenging for autistic individuals ;(Zolyomi et al., 2017, Lorenz & Heinitz, 2014). Zolyomi et al. (2017) examined neurodiverse team needs throughout the forming, norming, storming, and performing stages of teaming and how technology can support these needs. The findings revealed autistic students struggled to express their individual differences and had challenges addressing team conflict. For instance, participants were unable to speak feeling overwhelmed and stressed to their teammates, or did not explain absences at team meetings due to commuting difficulties, which resulted in poor peer evaluations. Unstructured group discussions and differences in work styles also created tension within the neurodiverse teams. In terms of conflict, participants were uncomfortable with

speaking up about completing tasks and were unsure if they would be perceived as pushy or anxious.

Similarly, conflict resolution was more challenging for autistic participants than non-autistic participants, based on self-evaluations (Lorenz & Heinitz, 2014). Although conflict resolution was identified as a challenge, community stakeholders strongly or somewhat agreed (Q24b - 86.96%) that *it is essential to identify the source and type of conflict and implement an appropriate conflict resolution strategy*. They also endorsed (Q24a – strongly or somewhat agree 69.57%) the idea that productive team conflict should be encouraged while dysfunctional conflict is discouraged. Relatedly, stakeholders supported win-win strategies over win-lose approaches (Q24a –73.91% strongly or somewhat agreed). Collaboration was also endorsed as an effective problem-solving strategy (Q24b, Q24c - 90.91% strongly or somewhat agree).

Confronting teammates can be challenging, but autistic students valued a team's ability to work towards and contribute to shared goals. A qualitative study (Zolyomi et al., 2017) examined the role of technology in supporting different values of neurodiverse student teams. Based on rankings of value statements, autistic students valued *team cohesion*, defined as a team's ability to contribute to the task and be productive by setting and meeting team goals. Community stakeholders agreed that team members should *help establish specific, challenging, and accepted team goals* (Q28a – strongly or somewhat agree 95.65%). Finally, Zolyomi et al. also identified the importance of learning, practicing, and adjusting to *team norms*, particularly around using asynchronous communication.

An editorial paper by Austin and Pisano (2017) published in the Harvard Business Review summarized their extensive access to neurodiverse programs at SAP and described increased productivity, quality, innovation, and employee engagement at the organization. In the study,

Austin and Pisano report that neurodiverse software testing teams at Hewlett Packard Enterprise outperformed neurotypical teams by 30%. This was attributed to excellent attention to detail and the ability to detect patterns that others miss. Regarding innovation, community stakeholders had mixed reactions to *teamwork as a conduit for thinking more creatively* (Q23a – 56.52% strongly or somewhat agreed; 26.09% neutral; 17.39% strongly or somewhat disagreed). Relatedly, stakeholders were mixed on the idea that *their work was enhanced in team or group situations* (Q23c – 21.74% strongly or somewhat agreed; 43.48% neutral; 34.78% strongly or somewhat disagreed). In spite of this preference for individual work, stakeholders agreed that *coordinating and synchronizing activities, information, and task interdependencies between team members* were important in teamwork (Q27a – 95.65% strongly or somewhat agreed).

The ‘Autism Advantage’

Autistic employees have unique strengths that are particularly well suited to high performing teams. Attention to detail was identified as a strength among 73% of respondents, followed by logical reasoning (60%), reliability (49%), focus (48%), and systemizing (47%) (Lorenz & Heinitz, 2014). These traits have been described as the “autism advantage” (e.g., Austin & Pisano, 2017) and promoted by organizations as a competitive edge. Indeed, attention to detail, pattern recognition, and systematizing are core strengths (e.g., Baron-Cohen et al., 2009), and pattern recognition, in particular, was identified in written responses by community stakeholders. These strengths should be considered in tandem with the associated cognitive costs for autistic workers (Kapp et al., 2013). In a systematic review by Bury et al. (2020), empirical findings of an autism advantage were mixed due in part to how skills like attention to detail were operationalized across studies and the lack of controlled objective studies. Community stakeholders agreed one of their strengths is

having a unique perspective on problem solving (Q11-95.65%). Stakeholders also agreed, albeit less enthusiastically, that attention to detail and focus was a strength (Q11b – 69.57% strongly or moderately agreed, 21.74% neither agreed nor disagreed). Related to Lorenz and Heinitz’s item of being reliable, stakeholders endorsed dedication to their team as a strength (Q11c – 82.61% strongly or somewhat agreed).

The *hyper-systematizing theory* provides theoretical underpinnings to the autism advantage and integrates the core traits and unique talents associated with autism (Baron-Cohen et al., 2009). Hyper-systematizing is a cognitive ability that allows one to construct systems. Baron-Cohen et al. (2009) posited three components of the theory: (a) hyper-systemizing, (b) hyper-attention to detail, and (c) sensory hypersensitivity. A theoretical paper by Annabi et al. (2017) evaluated existing cognitive theories of autism and supported the theory of hyper-systematizing for software developer roles, due in part because it is the only theory that addresses the cognitive talents of autistic individuals (e.g., versus theories on executive function or weak central coherence). Strengths and challenges were identified for each component of the theory. First, Annabi et al. posited that the hyper-systematizing trait is responsible for developing cognitive systems, which are constructs predicated on ‘if-then’ rules or input-operation-output reasoning. Once set in place, individuals tend to adhere to the system’s rules and standards. This trait is particularly effective for tasks like software development and adhering to coding rules. However, the rigidity of systems and rules makes it difficult to adapt to change. In dynamic team settings, the hyper-systematizing trait may make it difficult to readily adapt to the fluctuating pace of multiple tasks and projects.

Further to the construct of systems, autistic people tend to take a systems-based view and look for associations between rules *within* a system. This systems view drives autistic employees

towards completing tasks and achieving goals, but it can also lead to rigid routines. The ability to recognize repeating patterns is also associated with hyper-systematizing and is a beneficial trait for ‘debugging’ software or spotting errors. Stakeholder written responses also described pattern detection as a strength.

Secondly, hyper-attention to detail is related to a heightened focus on details and intense interest and passion in a specific topic (Annabi et al., 2017). Example of this hyper-attention to detail is the Israeli Defense Forces which employed a group of autistic workers who detected patterns in aerial and satellite imagery that others did not notice (Austin & Pisano, 2017). However, related challenges include managing one’s time, the potential to stifle innovation, and narrow interests or inability to see the ‘bigger picture’. Interestingly, this narrow interest and focus on detail also leads to out-of-box thinking that is characteristic of autistic people and is related to innovative thinking.

Lastly, sensory hyper-sensitivity is related to the ability to process a large volume of information from various sensory modes. This trait presents the core challenge of social communication among autistic people, particularly in person. Stakeholders echoed the challenge of sensory processing and overstimulation in their written responses.

Work-related and Social Communication

The literature identified social and interpersonal communication as a primary challenge. (Bury et al., 2021; Johnson & Joshi, 2016; McKnight, 2018; Morris et al., 2015; Remington & Pellicano, 2019). These communication challenges led to difficulties in understanding coworkers’ intentions, interpreting others’ emotions, and navigating organizational policies. Stakeholders agreed that their understanding of team dynamics differed from others (Q13c – 82.61% strongly or somewhat agreed). Concealing repetitive behaviours, or masking, was also

identified as a barrier to effective communication across two studies (e.g., Martin., 2020; Romualdez et al., 2021) and supported by stakeholders (Q15c – 86.96% agreed or somewhat agreed). Adjusting to new interpersonal relationships resulting from personnel changes was also particularly stressful. However, community stakeholder responses were neutral regarding personnel changes (Q13b – 69.57% neither agreed nor disagreed).

Notably, social communication difficulties were described as related to work tasks, social events, and work culture (Bury et al., 2021). Work-related communication includes coordinating with others and collaborating on solutions. These team processes are challenging when supervisors or coworkers do not give sufficient detail about the task at hand. Individuals expressed a desire for more clarity and detail from supervisors and coworkers, preferably delivered in writing instead of verbally (Bury et al., 2021; McKnight, 2018). Stakeholder responses regarding learning informal procedures and processes were mixed (Q13a – 39.13% neutral, 43.38% strongly or somewhat agreed, 17.39% strongly or somewhat disagreed). However, written responses echoed the impotence of written communication over verbal direction. One study by Martin et al. (2023) found that unclear communication from coworkers is a source of stress. Indeed, autistic workers are evaluated negatively when they do not understand the task they are expected to complete, do not ask for clarification, or have difficulties participating in team meetings (McKnight, 2018). Community stakeholder written responses supported this finding and stressed the importance of asking autistic coworkers for clarification rather than assuming their intent.

The norms associated with non-work communication and expectations to socialize outside work hours or in unstructured settings can be challenging to navigate. For instance, norms around socializing with others who are different in age, have a different sexual orientation, or at

a social event can result in feeling like an outsider (Bury et al., 2020; McKnight, 2018). In one example, celebrating birthdays at the office was stressful because of ambiguous cues around food-sharing (e.g., how much to eat, what to eat) and what to say (e.g., congratulating a coworker or not). This often resulted in feeling isolated and perceptions of rudeness, awkwardness, abrasiveness by others (McKnight, 2018). As a result of these social difficulties (particularly in unstructured or unscripted settings), individuals experienced bullying, ostracism, and isolation (Johnson & Joshi, 2016). Responses from stakeholders reflected these findings on informal team norms, and most did not agree that engaging in ritual greetings and small talk was important (Q25f – 27.27% strongly or somewhat agreed; 50.00% neutral; 22.73 strongly or somewhat disagreed).

Not all findings were stereotypical, as one study indicated an unexpected finding of an autistic worker as being quite a social (Hagner & Cooney, 2005). In line with this finding, stakeholder responses were split regarding the notion that *teamwork is a source of meaningful social connection* (Q15b – 34.78% strongly or somewhat agreed; 34.78% neutral; 30.43% strongly or somewhat disagreed).

Overall, challenges with social communication were primarily attributed to the autistic individual, rather than the external environment, coworkers, or supervisors. Among the reasons cited were a lack of self-awareness, and difficulty taking directions (Bury et al., 2021). In line with attributing challenges to the individual, strategies identified to cope with communication challenges were most commonly targeted at the individual (Bury et al., 2020; Lorenz & Heinitz, 2014; McKnight, 2018). Indeed, supervisors and coworkers believed social communications were best resolved by addressing the autistic individual (Bury et al., 2021; Martin et al., 2023; Scott et al., 2019). Examples included preparing and memorizing a script for difference

scenarios, role-playing, job-related training, and job coaching. Bury et al., (2021) examined workplace social challenges through the lens of autistic employees and supervisors in written responses to a survey. The responses were primarily attributed to internal factors, such as interpreting work protocols, learning to interpret others' behaviours, managing tasks, and maintaining work/life balance. Negative consequences of social challenges primarily affected the autistic employee directly. In contrast, additional communication challenges in stakeholder written responses identified *external* factors as sources of difficulties in communication: navigating others' interest in status/power games, lack of emotional safety, lack of acceptance, trust, bullying, and personality misunderstandings.

Health Outcomes of Work Experiences

Work-related and social interactions at the workplace were linked to poor health like increased anxiety, stress, and even depression (Bury et al., 2020; Holmes & Annabi, 2020; Johnson & Joshi, 2016; Morris et al., 2015). A paper by Holmes and Annabi (2020) proposed a framework that integrated common stressors for autistic individuals and common stressors for software professionals and arrived at seven stressors: noise from open workspaces, nuanced communication, visual/aural sensitivity, unique information processing, lack of role clarity, dynamic requirements, and organizational changes. Notably, Holmes and Annabi posited the outcomes of these stressors included a lack of trust, decreased psychological safety, feeling rejected, and fractured work relationships. These outcomes are all linked to increased stress and anxiety and were also reflected in stakeholder responses (Q15a – 73.91% - strongly or somewhat agree).

Disclosure, Stigma and Discrimination

Related to communication difficulties during work-related and social interactions, studies identified that while disclosing an autistic diagnosis or identity could improve coworkers' and managers' understanding and work accommodations, the issue of disclosure is complex (Lindsay et al., 2021; Remington & Pellicano, 2019; Whelpley et al., 2021; Zolyomi et al., 2017). Experiences and outcomes differed when individuals disclosed to managers compared to coworkers and ranged from tense and negative to feelings of pride and support. Community stakeholder responses reflected neutral views towards this finding (Q17c – 69.57% neither agreed nor disagreed). Written responses from stakeholders described more severe reactions from coworkers than managers and less willingness to disclose to coworkers. Nevertheless, disclosure is viewed as a personal choice, and individual experiences shape one's decision to disclose (Romualdez et al., (2021).

In some cases, individuals held negative views *toward disclosure* because of the stigma associated with autism, fear of discrimination, anxiety, tension, and a belief that disclosure does not yield any benefit (Whelpley et al., 2021). Relatedly, autistic students identified *freedom from stigma* as a value in neurodiverse teams (Zolyomi et al., 2017). Indeed, participants in Whelpley et al.'s (2021) study revealed negative outcomes resulting from disclosure to managers, where managers increased scrutiny and looked for autistic symptoms in their work, expressed frustration, questioned their competence and job performance, and distanced themselves. Stakeholders broadly endorsed this finding of negative outcomes of disclosure (Q17b - 78.26% strongly or somewhat agreed). In some cases, disclosure outcomes to managers were ambiguous, not wholly positive or negative, which also increased tension for autistic employees. When individuals disclosed to coworkers, this was sometimes met with animosity, active

discrimination, problematic stereotyping, and less frequently, resulted in bullying and inappropriate jokes. One study found positive reactions and experiences by autistic interns, coworkers, and supervisors, but these outcomes were contrasted with feelings of embarrassment from being “the autistic employee” (Remington & Pellicano, 2019; p. 523), and experiences with mental health challenges related to disclosure.

In contrast, some viewed disclosure positively and found it fostered better understanding from teammates. In such cases, disclosure led to openly sharing preferences for communication and work styles. Those who disclosed also cited responsibility to the autistic community and pride in their identity. Ultimately, disclosure decisions are influenced by the age of diagnosis (and relatedly, one’s autistic identity), social demands, and policies (Lindsay et al., 2021). Similarly, some participants reported kind and patient reactions from coworkers, having their needs taken into consideration, and willingness from coworkers to help (Whelpley et al., 2021). Community stakeholders had mixed reactions to the notion that *disclosure can lead to positive outcomes*, with 43.48% agreeing, 34.78% neither disagreeing nor agreeing, and 21.74% disagreeing (Q17a). Written responses from stakeholders identified the following additional considerations and outcomes of disclosure: being infantilized, being seen as disabled, fearing stigma, and having the condition used against them.

As with disclosure experiences, the *outcomes* of disclosure are mixed. Negative consequences of disclosure included active discrimination problematic stereotyping (Romualdez et al., 2021). In contrast, positive outcomes included improved mental well-being, understanding and support from others, and changes in the organization (Remington & Pellicano, 2019; Romualdez et al., 2021).

The Built Environment

Group discussions and meetings are common for teams to collaborate and coordinate. Annabi et al.'s (2017) theoretical paper on the hyper-systematizing theory of autism identified group settings like meetings as a possible source of discomfort because of sensory stimulation. For instance, taking notes while participating in group discussions may not come easily, but this can be mitigated by assigning someone to take and issue meeting minutes or recording meetings to refer back to contributing to work-related stress (Morris et al., 2015). The difficulty of multitasking is attributed to hypersensitivity and ability to process large amounts of sensory information at once (e.g., people talking over each other, straining to hear someone who has joined the meeting remotely, the sound of tactile keyboards, phones ringing, lighting, etc.; Annabi et al., 2017); Baldwin & Costley, 2016). *Community stakeholders agreed environmental factors like lighting and noise hamper their ability to focus (Q20a - 95.65%)*. Noisy, open-plan offices, harsh lighting, hot-desking (e.g., desk-sharing), and traveling to and from work were also identified as anxiety-inducing and stressful for autistic scholars working in an academic environment (Martin et al., 2023). Community stakeholders agreed with this finding (Q20a - 69.57% strongly or somewhat agreed) and also identified the following environmental factors: inconsistent workspace, visual clutter, having to wear work-appropriate clothing, feeling as though they are being observed by others, temperature, unexpected noise, strong smells, ability to wear noise canceling headphones, having a quiet space to decompress, and high foot traffic.

Supportive Coworkers

Studies identified the importance of a supportive environment for team-based work. Indeed, a lack of understanding by coworkers and supervisors was identified as a barrier to positive employment experiences. Scott et al. (2015) contrasted autistic employees and non-autistic employers' Q-Methodology rankings of statements on key factors of successful

employment. Employers identified an employee's capacity to work in teams as critical to leveraging job opportunities provided by the employer. Additionally, employers were supportive of working with an autistic team member and endorsed the viewpoint that internal team support should be provided to autistic employees. Team support was described as learning on the job, clarifying workplace culture, and clear communication, and requires a manager who encourages fairness and gives honest feedback in an approachable way. Another study examined senior management, supervisor, and coworker experiences working with autistic employees through a partnership with Autism Workforce, a private disability services provider. Coworkers reported undergoing training to work with autistic coworkers and felt comfortable doing so and even found the interactions to be enjoyable (Grenawalt et al., 2020). However, while autism training improved coworkers' understanding of workplace adjustments (e.g., low-stimulus workspaces, clear instructions, flexible hours), it did not affect their *confidence* in supporting autistic coworkers or their *understanding* of how autistic workers contribute positively to the workplace.

An interview study by Remington et al. (2019) examined the experiences of an autistic employee in a team-based perspective through a supported employment internship. Autistic interns were recruited at a bank, and semi-structured interviews were conducted with the interns and their hiring managers and colleagues. Findings from the study revealed complex and mixed reactions to the internship. For instance, interns, managers, and team members mainly had positive experiences, and the authors identified increased confidence and demonstrated competency from autistic interns as themes.

Inclusive Leaders

Studies identified the importance of effective leadership for autistic employees (Austin & Pisano, 2017; Hagner & Cooney, 2005; Martin et al., 2023; Parr et al., 2013; Remington &

Pellicano, 2019). The studies identified the need for leaders to tailor their approach to the needs of an individual (e.g., individualized leadership), but not in a demeaning way. Hagner and Cooney (2005) conducted semi-structured interviews with supervisors of autistic employees and identified several effective supervision strategies. A common thread across studies was the importance of being direct, specific, and consistent when explaining tasks and job responsibilities (Whelpley et al., 2021). A review by Bowman (2020) also identified clear and direct communication as an essential leadership trait linked to employment outcomes for autistic employees. A leader's knowledge of autism helped to facilitate interactions and minimize conflict. Examples included confirming communication is understood, being available to answer non-work related queries, encouraging coworkers to initiate interactions, and identifying one or two coworkers to support work duties if needed. Further, supervisors reported interacting with autistic workers like they would with non-autistic workers rather than treating them differently.

In one study, Martin et al. (2023) found that managers with previous experience with autism perceived higher-quality relationships with autistic employees. Martin et al. posited this was due to perceived similarity and general open-mindedness as antecedents of effective leadership-member exchange quality. (Austin & Pisano, 2017) also identify managers and leaders as important in including and integrating autistic workers in teams. Notably, despite it being lauded as a universally applicable leadership style, Parr et al., (2013) found transformational leadership to be related to higher anxiety and lower organizational commitment among autistic employees. The *inspirational motivation* component of transformational leadership that relies on emotional and symbolic language is not with the autistic challenges with socioemotional communication and abstraction. However, the *individualized consideration* facet of transformational leadership was related to lower anxiety and higher organizational

performance. This leadership trait of individualized consideration was also identified as a key characteristic tied to employment outcomes in Bowman's 2020 review. For instance, Whelpley et al., (2021) found that leaders adjusted their approach to autistic employees' needs, such as changing the timing or form of communication after recognizing frustration that arose from interactions. In other examples, managers intervened to support autistic employees when they noticed stress responses like panicking and self-stimulating or stereotypic behaviour. In another study, senior management demonstrated an essential role in recognizing improved productivity when an autistic worker was present and subsequently scheduled them for peak days of the week (Remington & Pellicano, 2019). Indeed, fostering an inclusive culture supportive of neurodiversity is important in autistic workers' experiences and outcomes (Bowman, 2020). Overall, supervisors, leaders, and senior management played an important role in supporting autistic workers by being supportive, being considerate of individual needs, promoting and upholding equitable values, and providing structure.

Culture of Inclusivity: Diversity on the Autism Spectrum

An emergent theme among some articles reviewed is a shift towards new perspectives for organizations in their equity, diversity, and inclusion approaches. An editorial article (Krzeminska et al., 2019) identified the tension between advancing the social good and advancing firm competitiveness when hiring autistic workers. Krzeminska and colleagues (2019) cited Pisano and Austin's (2017) claim of public relations and marketing advantages to having a neurodiverse workforce. Further, supervisors are said to hone their management skills to become better managers by considering the unique needs and working conditions that help autistic employees perform optimally, and when applied to all employees, increases the overall productivity of the group (Austin & Pisano, 2017). The review identifies tension between

neurodivergent needs and spillover effects on the working group. In other words, the experiences of autistic employees are not the same. Baldwin and Costley's (2016) paper also highlights diverse experiences among autistic employees. The article examines the results of an Australia-wide survey that identified stress and anxiety as common and frequent effects of work and social interactions in a survey study that included 82 autistic women. Compared to male participants, significantly more female participants reported social interaction difficulties and a belief in a clinical mental health condition. In a study by Vogus and Taylor (2018), a diverse climate is needed to create a sense of belonging that acknowledges and respects individual differences. A diversity climate is enacted by establishing flexible policies and practices.

Discussion

The management and organizational psychology fields and practitioners alike have largely overlooked the presence of intact neurodiverse teams in STEAM. These teams are involved in cutting-edge innovation. Yet, the needs of neurodiverse teams, comprised of autistic and non-autistic members, are not understood and left unmet by leaders and organizations. The aim of the scoping review was thus to understand the inner workings of these teams. The literature review on autism in high-performing teams revealed minimal insight into this topic (e.g., three studies). At the initial stages of the scoping review, the focus was on neurodiverse work teams. However, the literature revealed that examining work teams as a stand-alone unit of analysis would prove not only to be challenging given the scant number of studies but would also be an insufficient level of analysis. The phenomenon of neurodiverse teamwork is complex because of attitudes towards autism, consequences of disclosure, and a general lack of awareness about autism. This scoping review thus summarized themes that were not directly linked to the inner workings of neurodiverse team dynamics but identified factors that shape how autistic employees interact with those in their team environments.

Several themes emerged across the selected articles and were largely supported by community stakeholders. I conceptualized these themes into (i) internal factors, (ii) external factors, and (iii) outcomes of these factors to the autistic employee. Internal factors included teamwork skills, the autism advantage, work-related and social communication, and health outcomes of work. External factors included the built environment, supportive coworkers, inclusive leaders, and a culture of inclusivity.

The scoping review findings identify autistic, coworker, and supervisor experiences, as well as considerations for organizations to support neurodiverse teams. These findings have

theoretical implications for research on autism in teams and practical implications that can be applied to the workplace. Future research directions are also identified to support further development of research on neurodiverse team dynamics.

Theoretical Implications

This review makes two contributions to the literature: (1) neurodiverse teams undergo team processes specifically related to the traits of autistic team members, and (2) neurodiverse teams encounter unique challenges related to disclosure and stigma.

Neurodiverse Team Processes

First, neurodiverse teams have unique experiences of team processes compared to neurotypical teams. Specifically, teams with autistic workers have an advantage in goal progression (action processes) but face challenges with specific team processes, namely coordination, backup behaviour (action processes), conflict management, and affect management (interpersonal processes) (Marks et al., 2001). A hallmark of the ‘autism advantage’ (Bury et al., 2020; Austin & Pisano, 2017) includes above-average goal commitment and hyperfocus. Supervisors and leaders leverage these traits to improve their team productivity (e.g., Remington & Pellicano, 2019) which ultimately influences how neurodiverse teams experience *goal progression*. In contrast, *coordination* was identified as a top challenge among autistic workers (Annabi et al., 2017; Annabi & Locke, 2019; Richards, 2012). Several studies identified communication challenges related to coordinating with others on work tasks, particularly around insufficient detail from coworkers and leaders (McKnight, 2018); (Khalifa et al., 2020); (Bury et al., 2021). Additionally, *backup behaviour* was mixed across studies. Examples of backup behaviour include helping teammates by giving feedback and coaching, asking for help, and helping teammates complete tasks. Some studies identified positive support from coworkers and

supervisors, while others indicated giving and receiving feedback related to task completion as very challenging. Unsurprisingly, autistic team members faced challenges with interpersonal processes like *conflict management* and *affect management*. Autistic workers reported being described by their peers as abrasive or rude, which is attributable to differences in social communication. These interactions were marked by avoidant behaviours, particularly in unstructured settings (Zolyomi et al., 2018; Hurlbutt & Chalmers, 2004). Individuals also experience stress and anxiety related to team interactions (Zolyomi et al., 2018), which affect an individual's well-being.

While neurodiverse and neurotypical teams experience all team processes (e.g., transition, action, and interpersonal), there was a particular focus across on coordination, backup behaviour, and interpersonal processes. None of the studies explicitly examined autistic experiences related to transition processes like planning, strategy, and goal prioritization. Future research is needed to understand how the autistic trait of hyper-systematizing (e.g., Baron-Cohen et al., 2009) relates to specific team processes like mission analysis (e.g., evaluation and troubleshooting of past performance Marks et al. 2001). Teams benefit from autistic members' strengths (e.g., goal progression), but this can come at a cost to the autistic member (e.g., increased risk of anxiety and stress from interpersonal interactions).

Going Beyond the Team-level in Neurodiverse Teams

The topic of neurodiversity and autism was previously confined to medicine, psychology, vocation, and rehabilitation studies and only recently emerged as a new topic in team, organization, and management studies. As a result, most articles included in this scoping review were descriptive, and few offered analysis and insight into the functioning of neurodiverse teams. There is a striking difference between the teams literature, a mature body of literature that

scrutinizes team dynamics through dozens of team models and team constructs, compared to the literature on autism in work teams, which is scant (Zolyomi et al., 2017, 2018; Annabi & Locke, 2019). The results of this scoping review revealed the complexity of neurodiverse teamwork, such as that teamwork itself cannot be adequately examined through dyadic interactions within a team or as an aggregate of team scores as is often the case in team studies. Whereas the boundary condition for team studies dictates an investigation at the team level, this scoping review highlights the need to go outside the boundaries of teamwork to understand neurodiverse team performance adequately. Indeed, an ecosystem approach is needed to understand neurodiverse teamwork, as the employment of autistic individuals is tied to broader community and family support, workplace capacity building, and policy (Nicholas et al., 2019)

Disclosure in Neurodiverse Teams

Third, the scoping review identified disclosure as a unique factor of neurodiverse teams. The decision to disclose and the consequences of disclosure impacts the autistic individual, coworkers, and leaders. Disclosure of an autistic identity was characterized by concerns of being stigmatized and discriminated against and often viewed as not having any benefit. Voluntary disclosure is not always possible if coworkers and supervisors can identify autistic traits. In such cases, the team dynamic is undoubtedly affected by involuntary disclosure.

In contrast, disclosure can lead to effective team interactions when coworkers and supervisors understand autism and what individuals can bring to the team. Many of the social communication challenges can be proactively addressed in these cases. Additionally, a developmental disability like autism differs from race, gender, and sexual orientation because it directly relates to task performance (Quinn et al., 2004). As such, disclosure can increase experiences of ostracism, discrimination, marginalization, and isolation (Baldrige & Veiga,

2001). Unfortunately, strong, negative reactions to bullying or ostracism can perpetuate instigators' bullying behaviour, as they are motivated to illicit more negative reactions (Schroeder et al., 2014). While disclosure of autism was prominent across studies, it is absent in studies that examine team dynamics. With the increasing focus on inclusion and diversity in team literature, further research is required to understand how disclosure affects team interactions and effectiveness.

Practical Implications

Autistic Workers

Several practical implications emerged from the scoping review related to (1) autistic individuals, (2) coworkers, and (3) leaders. First, there is an overemphasis on the challenges that autistic individuals face in work and team settings, such as sensitivity to environmental stimulus, socioemotional communication differences, and coping methods (e.g., Bury et al., 2021; Annabi & Locke, 2019; Holmes et al., 2020). The burden is disproportionately on autistic individual to improve their social communication and teamwork skills or access workplace accommodations (e.g., Scott et al., 2015; Johnson & Joshi, 2014). This deficit-based view requires the autistic individual to adjust and conform to normative neurotypical standards. Individuals should highlight the strengths they bring to teams, such as deep-level expertise, excellent quality assurance/quality checking (QA/QC) related to hyper-attention to detail, and innovative ideas related to systematizing (Austin & Pisano, 2017). Finally, autistic workers should be aware of disclosure outcomes if they choose to do so. Disclosure may be required to access accommodations in specific organizations, but individuals should be mindful of its potential adverse effects, such as being stereotyped, ostracism, and even being overlooked for advancement opportunities (Johnson & Joshi, 2014)

Coworkers

Secondly, non-autistic coworkers have a crucial role in the success of neurodiverse teams. Autistic people are often characterized as misunderstanding others and missing social cues. Still, the *double empathy problem* (e.g., Milton, 2012) suggests that likewise, non-autistic individuals also misunderstand others (i.e., their autistic coworkers). Along this vein, interpersonal interactions should be reciprocal and mutual and highlights an overemphasis on a deficit view of autism in communication. Coworkers can strive to deepen their understanding of autism and acknowledge the strengths of autistic coworkers by participating in formal neurodiversity training if it is offered by the organization. Further, coworkers can be supportive by checking with autistic coworkers on communication preferences and work styles and appropriately initiating interactions (Hagner & Cooney, 2005). Workers should communicate clearly and offer clarification when interacting with autistic coworkers.

Leaders

Third, team leaders, supervisors, managers, and senior management should also participate in autism and neurodiverse training (if offered by the organization) to understand the needs of autistic workers, their strengths, and opportunities for leaders to support them. If neurodiversity training is not provided through the organizations, leaders should advocate for broadening organizational support and acceptance of neurodiversity. As leaders of their organization, they should cultivate an ecosystem of support (e.g., Austin & Pisano, 2019) that accepts neurodivergent behaviours and ways of thinking. For teams to optimally perform, innovate, and benefit from different perspectives, leaders must establish explicit norms and accountability structures to encourage divergent views without unconstructive conflict (Dwertmann et al., 2016). Leaders must, therefore recognize they have a role in creating norms on acceptance and

support for neurodivergent employees (Whelpley et al., 2021). Furthermore, leaders should consider how jobs can be modified for individual needs, such as maintaining consistent schedules and duties, keeping interpersonal interactions predictable, or reducing unstructured tasks. To support interpersonal communication, supervisors should be direct and concise with feedback and provide it in written form, clarify that instructions are understood, and interpreting social cues that may arise (Hagner & Cooney, 2005).

In contrast, leaders must understand the health and well-being consequences of discriminatory behaviors towards autistic workers and be aware they have a higher risk of stress, anxiety, and depression related to work. In response, leaders must be ready to direct autistic employees to appropriate organizational resources. Further, leaders should focus on individualized consideration for neurodiverse teams to meet the diverse needs of each individual, including communication preferences, work styles, and personalities. This also includes understanding and accommodating individual needs for quiet workspaces, work-from-home arrangements, or allocating tasks such as note-taking during team meetings to prevent sensory overstimulation. Most importantly, leaders set the tone and norms for their team and have an opportunity to create team climates that are supportive of autistic members.

Organizations

Neurodiverse teams need a climate of diversity and inclusion to thrive and feel accepted and valued (Hayward et al., 2019). Although the literature on autism in workplaces has largely focused on their challenges, the neurodiversity movement has buoyed a recognition of autistic employees' strengths and contribution to innovation and performance (e.g., Austin & Pisano, 2019; Bury et al., 2020). Minimally, organizations should conduct company-wide neurodiversity training through third-party organizations that specialize in neurodiversity. Topics may include

why neurodiversity matters, how it manifests in the workplace, inclusive retention strategies, mental health, and disclosure (Centre for Interdisciplinary Research and Collaboration in Autism, 2023).

Organizations must acknowledge this autism advantage comes at a personal cost to individuals (e.g., [Krzeminska et al., 2019](#)). This review revealed that the burden to adapt is often on the autistic employee, and this approach ignores the reality that not all employees are neurotypical. While much work can be done at the individual level among coworkers and leaders, organizations can enact policy and processes to support the needs of autistic employees. Organizational interventions should be integrated into onboarding procedures, recruitment, retention, and advancement procedures ([Annabi et al., 2017](#); [Whelpley & Perrault, 2021](#)). Specifically, transparent processes for accommodation needs while respecting the individual's preference on disclosure providing training to staff on autism and other forms of neurodivergence. Organizations can also hire job coaches to help adjust to the company culture and norms and navigate interpersonal relationships ([Austin & Pisano, 2017](#)).

Further, addressing the communication strategies experienced by autistic employees would benefit non-autistic employees as well. For instance, providing clear, written communication is a widely accepted practice in project teams, mainly when dispute arises. Emphasizing the importance of this form of communication would thus support autistic employees without the risk of 'outing' them. Similarly, giving employees the flexibility to control their work environments would benefit non-autistic employees, such as those with ADHD. These are mainly inexpensive strategies that can be easily implemented, but organizations must be mindful of the diverse needs of neurodiverse individuals. Finally, with the increasing demand for

STEAM-related jobs, organizations have an opportunity to adapt to the needs of neurodivergent individuals and attract this valuable talent pool to their organizations.

Limitations

One of the initial aims of this study was to examine high-performing teams that were neurodiverse in composition. However, the paucity of studies on such teams required revising the search strategy. As a result, the scoping review included studies on teams in work, internship, post-secondary, and high school settings. Further, the initial inclusion criteria of STEAM-related sectors were intended as a proxy for high-performing teams. However, these criteria also had to be revised and expanded to include all work sectors and ranged from STEAM to retail and manufacturing. This limitation was partially addressed by consulting with stakeholders who met the criteria of work experience in STEAM settings and acted as subject matter experts to evaluate the findings. Secondly, consultation with autistic stakeholders was conducted after the preliminary results of the scoping review, which aligns with Levac et al.'s (2010) recommendations. However, consulting with stakeholders during the identification of themes likely resulted in different thematic categories and labels. Third, the scoping review does not consider the nuanced experiences of autistic workers with other intersecting identities, such as gender, ethnicity, or sexual orientation. Individuals with two or more historically marginalized identities are at a higher risk of prejudicial treatment and may require more severe interventions from the organization. The findings of this review should thus be interpreted with caution and with the understanding that high-performing neurodiverse teams may have other unique characteristics that have not been identified in this review.

Future Directions

The scarce number of studies related specifically to neurodiverse team functioning indicates a need for further investigation into the inner workings of these teams. The findings on autistic, coworkers, and supervisor experiences in the workplace can be generalized to intact teams to a certain degree. Still, there was an overemphasis on differences related to autism across the studies. Thus, a new body of research is needed to empirically examine how neurodiverse team composition affects team transition processes like planning and strategy and constructs like team cohesion, shared mental models, and psychological safety. The autism advantage is promoted by organizations like SAP, Microsoft, and Dell, and the neurodiversity movement is gaining momentum in organizations. However, still, little is understood empirically about the effect of neurodiverse teamwork on innovation.

Furthermore, the review found that disclosure is an important and complicated topic when an autistic member is part of a team. Further investigation is required to understand the effects of disclosure on team member attitudes and how that influences team behaviors. Researchers should also consider how other marginalized identities intersect with autism and the impact on interpersonal interactions.

Conclusion

The scoping review revealed nine themes across 29 studies: (1) teamwork skills, (2) the autism advantage, (3) work-related and social communication, (4) health outcomes of work experiences, (5) disclosure, stigma, and discrimination, (6) the built environment, and (7) the importance of supportive coworkers, (8) inclusive leadership, and (9) a culture of inclusivity and acknowledges diversity across the autism spectrum. Overall, the review indicated a surface-level focus on team-based experiences, such that the studies focused at length on differences between

autistic and non-autistic workers. None of the studies looked at how neurodiverse teams function and perform. The findings suggest that goal progression is a potential strength of neurodiverse teams, while coordination, backup behaviour, and interpersonal processes may affect overall team performance. Yet, neurodiverse teams cannot perform optimally without an ecosystem of support from coworkers, leaders, and the organization.

Appendix A – Stakeholder Consultation Questions

Demography (3 items)

1. What gender do you identify with?
 - a. Female
 - b. Male
 - c. Prefer not to disclose
 - d. There are no options that apply to me. I identify as _____
2. What is your age?
3. My race or ethnicity is (please check the most appropriate response):
 - a. White, Anglo, European American; not Hispanic
 - b. Asian (including Chinese, Japanese, and others)
 - c. Black (including African-Canadian/African-American, African)
 - d. Hispanic or Latino (including Mexican, Central American, and others)
 - e. East Indian
 - f. Middle Eastern
 - g. Mixed; Parents are from two different groups (select all that apply)
 - h. Other, please specify: _____

Autism Spectrum Disorder (2 items)

1. Have you ever been diagnosed with autism, Asperger's syndrome, or autism spectrum disorder by a doctor or health professional?
2. (a) If yes, how old were you at the time of the diagnosis?
2. (b) If no, do you self-identify as autistic?

Work Experience (3 items)

1. Do you have 3+ months experience working in a discipline related to science, technology, engineering, arts, or math?
2. How many months/years of cumulative work experience do you have?
3. How many months/years of experience do you have working in a team environment?

Autism and the Workplace (17 items, 6 open)**Strengths of Autism in Teamwork (3 items, 1 open-ended)**

The term, “autism advantage,” is used to describe unique skills that autistic workers bring to the table, such as attention to detail, tolerance for repetitive tasks, and specialized interests.

Please respond to the following questions based on your experiences at work.

The following responses are provided on the following Likert scale:

1 - Strongly Disagree 2 – Disagree 3 – Neutral 4 - Agree 5 - Strongly Agree

1. I offer unique or creative perspectives when it comes to problem solving.
2. Excellent attention to detail or focus are among my best qualities.
3. I am highly dedicated to their work and teams.
4. (Open-ended item) What are other strengths related to autism that benefit teamwork?

Challenges of Autism in Teamwork (3 items, 1 open-ended)

In contrast to the unique advantages that autistic members bring to teamwork, there are specific challenges unique to autism. This includes challenges related to social communication and interaction, rigidity in schedule, and abstraction.

Please respond to the following questions based on your experiences at work.

The following responses are provided on the following Likert scale:

1 - Strongly Disagree 2 – Disagree 3 – Neutral 4 - Agree 5 - Strongly Agree

1. (R) I don't find it difficult to learn informal procedures and processes.
2. Changes in team member roles and responsibilities do not bother me.
3. I have a different understanding of my team's dynamics than others.
4. (Open-ended item) What are some challenges related to autism that make it difficult to work in teams?

Personal Cost of Working in Teams (3 items, 1 open-ended)

Even though interpersonal interactions are challenging for autistic workers, many individuals do so effectively at work. However, interacting with others can come at a personal cost. Such interactions can be anxiety inducing and emotionally depleting.

Please respond to the following questions based on your experiences of teamwork.

The following responses are provided on the following Likert scale:

1 - Strongly Disagree 2 – Disagree 3 – Neutral 4 - Agree 5 - Strongly Agree

1. Interacting with others in team settings makes me feel anxious or stressed.
2. Teamwork is a source of meaningful social connection.
3. I hide parts of my personality to fit in with the team.

4. (Open-ended item) What can team members and team leaders do to support autistic team members? (e.g., communication style or mode)

Disclosure, Stigma, and Discrimination (3 items, 1 open-ended)

Research indicates there is a disconnect between autistic workers and employers/coworkers on the topic of disclosure. There is reluctance by individuals to disclose their autism diagnosis at the workplace because of perceived negative outcomes, like stigma and discrimination. In contrast, non-autistic workers believe there are positive outcomes from disclosure, such as accommodation and support (Thompson-Hodgetts et al. 2020).

Please respond to the following questions based on your experiences at work.

The following responses are provided on the following Likert scale:

1 - Strongly Disagree 2 – Disagree 3 – Neutral 4 - Agree 5 - Strongly Agree

1. Disclosure can lead to positive support from others.
2. Disclosure can lead to undesirable outcomes like stigma and discrimination.
3. The impact of disclosure is the same regardless of who you disclose to (e.g., supervisor versus coworkers).
4. (Open-ended item) How does disclosing/not disclosing impact the way you interact with others in a team?

Universal Design (2 items, 1 open-ended)

A characteristic of autism is sensory sensitivities. Organizations have an opportunity to improve their physical spaces to support the needs of autistic workers (Gaines, 2016).

Please respond to the following questions based on your experiences at work.

The following responses are provided on the following Likert scale:

1 - Strongly Disagree 2 – Disagree 3 – Neutral 4 - Agree 5 - Strongly Agree

1. (R) I can work effectively in an open plan office environment.
2. Having control over lighting or external noise makes a difference in my ability to focus.
3. (Open-ended item) What other factors in the physical environment affects your productivity?

Organization, Leaders, and Team Members (1 open)

Neurodiverse teams are defined as having members who are autistic and non-autistic.

1. (Open-ended item) What can organizations, team leaders, and/or team members do to support neurodiverse teamwork?

Teamwork (18 items)

The following items are about teamwork.

The following responses are provided on the following Likert scale:

1 - Strongly Disagree 2 – Disagree 3 – Neutral 4 - Agree 5 - Strongly Agree

Kline Teamwork Scale (4 items)

1. Working in a team/group gets me to think more creatively.
2. I enjoy working on team/group projects.
3. Team/group work is overrated in terms of the actual results produced.
4. My own work is enhanced when I am in a team/group situation.

Teamwork KSAs (Stevens & Campion, 1994) (14 items)***Interpersonal Interactions***

1. Recognize and encourage desirable team conflict, but discourage undesirable team conflict
2. Recognize the type and source of conflict confronting the team and to implement an appropriate conflict resolution strategy.
3. Employ an integrative (win-win) negotiation strategy rather than the traditional distributive (win-lose) strategy.

Collaborative Problem Solving

1. Identify situations requiring participative group problem solving and to utilize the proper degree and type of participation.
2. Recognize the obstacles to collaborative group problem solving and implement appropriate corrective actions.

Communication

1. Understand communication networks, and to utilize decentralized networks to enhance communication where possible.
2. Communicate openly and supportively, that is, to send messages which are: (1) behavior- or event-oriented; (2) congruent; (3) validating; (4) conjunctive; and (5) owned.
3. Listen nonevaluatively and appropriately use active listening techniques.
4. Maximize consonance between nonverbal and verbal messages, and to recognize and interpret the nonverbal messages of others.
5. Engage in ritual greetings and small talk, and a recognition of their importance.

Goal Setting and Performance Management

1. Help establish specific, challenging, and accepted team goals.
2. Monitor, evaluate, and provide feedback on both overall team performance and individual team member performance.

Planning and Task Coordination

1. Coordinate and synchronize activities, information, and task interdependencies between team members.
2. Help establish task and role expectations of individual team members. and to ensure balancing of workload in the tea

Appendix B - Descriptive Characteristics of Articles Relating to Autism in Work Teams (K=29)

Author (year), Country	Study Design	Participants	Objective	Outcome Measures	Findings	Quality and Level of Evidence
mnabi & Locke (2019)	Theoretical framework	N/A	Review the existing literature on autism employment and synthesize it into a theoretical framework to study IT workplace readiness to equitably include individuals with autism in the workplace.	Organizational interventions mitigating individual barriers (OIMIB) framework adapted to IT employment	The OIMIB framework was extended to include theory of planned behaviour knowledge and attitude constructs to provide a theoretical lens to investigate employment and equitable inclusion of individuals with autism in the IT workplace.	Limited (4/20), V
Annabi et al. (2017), USA	Theoretical framework	N/A	Apply the theory of hyper-systematizing to autistic software developers to identify strengths and strategies to support autistic employees	Theory of hyper-systematizing, software developer skills (O*NET)	Autism leans towards a range of analytical skills (information processes and systemizing) especially suitable for software development <i>and</i> create challenges in managerial,	Good (15/20), V

Author (year), Country	Study Design	Participants	Objective	Outcome Measures	Findings	Quality and Level of Evidence
					interpersonal, and communication skills.	
Austin & Pisano (2017), USA	Editorial	N/A	Promote autism and neurodiversity as a competitive advantage for organizations	N/A	Organizations can have a competitive advantage by retaining autistic and other neurodiverse talent.	Limited (10/20), V
Baldwin et al.	Survey <i>continued</i>	Individuals diagnosed with autism in Australia, data from the <i>We Belong I study</i> : N=130 (32% female; 68% male), age: M=35.6 (12.4), 18-65	Describe the employment activities and experiences of 130 adults with Asperger's Disorder (AD) and high functioning autism (HFA) in Australia	Current occupation; occupational skill level and alignment with educational attainment; type of job contract; hours of work; support received to find work; support received in the workplace; and positive and negative experiences of employment	Despite their capacity and willingness to work, autistic individuals face significant disadvantages in the labour market and a lack of understanding and support in employment settings	Adequate (12/20), III Study 2: Adequate (15/22), II

Author (year), Country	Study Design	Participants	Objective	Outcome Measures	Findings	Quality and Level of Evidence
Baldwin & Costley (2016), Australia	Survey	Females diagnosed with autism in Australia: $n=82$; age: $M=32.7$ (18-64) Comparative males diagnosed with autism in Australia: $n=200$; age: $M=33.2$ (18-70)	Understand the lived experiences of female autistic individuals and how it compares to male counterparts	Questions from the survey related to health and wellbeing, education, employment, social and community activities, support needs, and future aspirations	While there are similarities between women and men, the challenges faced by autistic women are diverse and complex, including high levels of mental health disorder, unmet support needs in education settings and the workplace, and social exclusion and isolation.	Good (14/20), II
Bowman (2020), USA	Editorial	N/A	Understand what is known about organizational leadership behaviors or characteristics that create positive employment outcomes for autistic employees	Employment outcomes	There are four key leadership behaviors or characteristics that are important for those leading individuals with ASD: providing clear and direct communication, knowing about ASD, providing individualized consideration, and	Limited (4/20), V

Author (year), Country	Study Design	Participants	Objective	Outcome Measures	Findings	Quality and Level of Evidence
					creating a work environment accepting of neurodiversity.	
Bury et al. (2020), Australia, New Zealand, Europe, North America, South America, Asia	Exploratory study	Individuals diagnosed with autism from Australia: $n=29$ (51.7% female, 49.9% male); age: $M=40.93$ (414.56) Supervisors or support workers of autistic employees: $n=15$; age: $M=44.40$ (412.34)	Identify workplace-based social challenges, their interpretation, consequences and resolution	Online survey related to social rules, interpreted intentions, and descriptions of interactions	Neurodiversity programs induce companies and their leaders to adopt a style of management that emphasizes placing each person in a context that maximizes their contributions.	Study 1: Good (14/20), III Study 2: Adequate (15/22), III

Author (year), Country	Study Design	Participants	Objective	Outcome Measures	Findings	Quality and Level of Evidence
Bury et al. (2020), USA	Systematic Review	Individuals diagnosed with autism across 5 studies with reported demographic data: $N=125$ (20 (30.30%) female, 46 (69.70%) male), age: $M=35.27$ (9.91)	Examine evidence supporting the superior workplace performance of employees on the autism spectrum, particularly regarding restrictive and repetitive behaviours and interests.	Restrictive and repetitive behaviours and interests (attention to detail, tolerance for repetitive tasks, special interests) and employment related outcomes	Due to the nature and quality of the 6 identified studies there is currently no strong evidence supporting or negating a workplace autism advantage.	Strong (17/20), III
Grenawalt et al. (2020), Australia	Case study (interviews; focus groups)	Individuals diagnosed with autism in the USA: $n=4$; age: 21-24 Senior-level management: $n=6$ Supervisors: $n=8$	To understand (a) the perspectives of the employees and leadership at the organization about the autism initiative and (b) the characteristics of the business that led to the	Focus group and interview protocol questions	Hiring autistic individuals was positively perceived by other employees, and influenced by changes to the physical work environment, diversity training specific to individuals with disabilities, and a company climate of	Adequate (11/20), III

Author (year), Country	Study Design	Participants	Objective	Outcome Measures	Findings	Quality and Level of Evidence
		Co-workers: <i>n</i> =14	success of the initiative		engaging and supporting autistic employees	
Hagner & Cooney (2005), UK	Semi-structured interviews, observational	Employees diagnosed with autism in USA: <i>n</i> =14, age: 22-36; gender not reported Supervisors of autistic employees in USA: <i>n</i> =14	Identify factors that contribute to successful employment	Questions from the semi-structured interview guide	Supervisory accommodation strategies were commonly associated with successful supervision: maintaining a consistent schedule and set of job responsibilities, using organizers to structure the job, reducing idle or unstructured time, being direct when communicating with the employee, and providing reminders and reassurances.	Adequate (14/20), III

Author (year), Country	Study Design	Participants	Objective	Outcome Measures	Findings	Quality and Level of Evidence
Holmes et al. (2020), USA	Editorial	N/A	Synthesize the existing literature relevant to software workplace stressors for autistic people, and proposes a framework to guide further research to investigate the implications of and mitigate stressors in the software industry for autistic software developers.	N/A	Proposed framework to guide further research to investigate the implications of and mitigate stressors in the software industry for autistic software developers	Limited (7/20), V
Johnson & Joshi (2014)	Commentary	N/A	Describe the barriers of disclosure for autistic workers	N/A	Disclosure is complex and social characteristics of disclosure can create challenges (e.g., lack of control over the	Limited (8/20), V

Author (year), Country	Study Design	Participants	Objective	Outcome Measures	Findings	Quality and Level of Evidence
Johnson et al. (2016), USA	Interviews, survey	Individuals diagnosed with autism: <i>n</i> =30, age: 24-58	Understand the phenomenon of stigma associated with autism in the workplace	Interview guide that included: interest of the participant, personal and employment experiences, nature andn context of diagnosis, consequences of diagnosis on work and employment outcomes Study 2: Diagnosis age, adapted Workplace Prejudice/Discrimination Inventory, organization-based self-efficacy, 20-item State Anxiety Inventory, disclosure, job social demands (O*NET), Autism Policy Index	decision to disclose, targets, tactic of disclosure) Study 1: Disclosure of the diagnosis, social demands associated with a job, or accepting/ rejecting organizational support involve “adaptive decisions” associated with stigma expression/suppression. Patterns were detected in how those who were diagnosed earlier versus later in life responded to various contingencies at work, especially with their jobs’ social demands. Study 2: Disclosure	Study 1: Strong (19/20), III Study 2: Good (17/22), III

Author (year), Country	Study Design	Participants	Objective	Outcome Measures	Findings	Quality and Level of Evidence
					exacerbated the negative relationship between the age of diagnosis and two indicators of well-being—perceived discrimination and organization-based self-esteem. Conversely, among those diagnosed earlier, disclosure seems to mitigate stigma-induced threat predicting slightly higher work-place well-being.	
Johnson et al. (2020), USA	Narrative literature review	N/A	Determine how human resource development professionals can foster skill development and promote a work environment that	Coded for purpose, findings, and themes	Key themes were identified as critical employment strategies within the scope of human resource development: meaningful collaboration, training	Strong (17/20), II

Author (year), Country	Study Design	Participants	Objective	Outcome Measures	Findings	Quality and Level of Evidence
			supports the success of employees with ASD		and development, mentoring and coaching, organizational support factors	
Krzemińska (2019), Australia	Editorial	N/A	Promote the generation and systematization of knowledge on neurodiversity talent management	N/A	Neurodiversity employment programs present major opportunities to address theoretical issues within management research.	Limited (9/20), V
Lindsay et al. (2019), USA, Canada, Australia, France, Portugal, Switzerland, UK	Systematic Review	Individuals diagnosed with autism from USA, Canada, Australia, France, Portugal, Switzerland, UK: <i>n</i> =7,009 (26.99% female, 72.99%	Describe the prevalence and processes of disability disclosure for persons with autism spectrum disorder.	Study 1: diagnosis is a milestone event that triggers negative and positive responses to work; Study 2: Diagnosis age, disclosure, job social demands, Workplace well-being, organizational support	Disclosing a condition of autism in the workplace and requesting accommodations is complex.	Good (14/20), III

Author (year), Country	Study Design	Participants	Objective	Outcome Measures	Findings	Quality and Level of Evidence
Lorenz & Heinitz (2015), Germany	Survey	Individuals diagnosed with autism: from Germany: <i>n</i> =136 (86 women, 46 men, 4 other); age: <i>M</i> =35.54, <i>SD</i> =9.05, 18-60 Non-autistic individuals from Germany: <i>n</i> =155 (91 women, 62 men, 2 other); <i>Mage</i> = 33.5 years, <i>SD</i> = 9.05	Provide a primary overview of the professions, strengths and job interest profiles of individuals with Asperger's.	Online survey with questions related to: occupational strengths, general self-efficacy, occupational selfefficacy, and the job interest profile	Individuals with Asperger's indicate lower self-efficacy, both general and occupational. Furthermore, a high concentration of individuals with Asperger's can be found in the areas I (Investigative) and C (Conventional) of Holland's RIASEC model.	Adequate (11/20), III

Author (year), Country	Study Design	Participants	Objective	Outcome Measures	Findings	Quality and Level of Evidence
2	Case histories; Semi-structured interviews	Individuals diagnosed with autism: <i>n</i> =9 (1 female, 8 male) Managers of autistic employees: <i>n</i> =8 Job coaches of autistic employees: <i>n</i> =5	Understand the organizational factors that influenced the organizational socialization of autistic employees.	Interview guides, including questions on hiring, on-boarding, training, job performance, relationships with coworkers, obstacles encountered, adaptations and support, the perception of upper management of the organization toward the autistic employee and relevant organization's policies	High-quality relationships between supervisors and supervisees are important for positive employment outcomes of autistic employees in organization. Skilled communication facilitation is a novel antecedent to leader-member exchange, as a potentially key factor for autistic employees.	Good (15/20), III
Morris et al. (2015), USA	interview and survey	Interview: Individuals diagnosed with autism or self-identified as autistic: <i>n</i> =10 (1 female, 9 male); <i>Medage</i> : 45.5 Survey: Total	Explore how technology can aid neurodivergent employees in the workplace.	technical skills, communication modes, navigating workplace situations		Strong (16/20), III

Author (year), Country	Study Design	Participants	Objective	Outcome Measures	Findings	Quality and Level of Evidence
		participants: $n=781$ (107 female, 718 male, 21 preferred not to say); $Medage=32$; Individuals diagnosed with autism or self-identified as autistic: $n=69$				
Parr et al. (2013), USA	Survey	Individuals diagnosed with autism across 5 studies with reported demographic data: $N=52$ (27 female, 25 male)	Determine if a subset of transformational leader behaviours hamper organizational outcomes for autistic employees	Transformational leadership, Generalized Anxiety Disorder-7 Scale (GAD-7), Affective Commitment Scale, Member Liking of the Leader scale, self-reported performance	Transformational leadership behaviors, in positive and negative fashion, were significant predictors of anxiety levels.	Strong (18/20), III

Author (year), Country	Study Design	Participants	Objective	Outcome Measures	Findings	Quality and Level of Evidence
Remington & Pellicano (2018), UK	Semi-structured interviews, multi-informant, longitudinal	Individuals diagnosed with autism: $n=8$ (2 female, 6 male) Managers, buddies, and team members of autistic interns: $n=25$ (9 female, 16 male)	Examine internship experiences of autistic university students and non-autistic managers and coworkers (employment offers, confidence, contribution, skills development), benefit to colleagues and company	Interview guide with questions relating to	Internship experiences were described as positive, meaningful for the majority of those involved, however, some interns also reported anxiety, difficulties in judging communication and confusion regarding office rules.	Study 1: Strong (18/20), III Study 2: Strong (20/22), III
Remington et al. (2021)	Semi-structured interviews; survey; multi-informant	Interns diagnosed with autism: $n=15$ (1 female, 14 male); $M_{age}=25$, (21-36) Non-autistic interns: $n=12$ (4	Compare the experiences of autistic and non-autistic interns at an internship	Work self-efficacy, employee performance	Autistic interns and their managers shared positive internship experiences. Structured delegation of tasks and flexible communication were successful strategies used by managers to support	Strong (17/20), III

Author (year), Country	Study Design	Participants	Objective	Outcome Measures	Findings	Quality and Level of Evidence
		female, 8 male); <i>Mage</i> =20 (19- 21) Managers of autistic intern: <i>n</i> =16 (7 female, 9 male); <i>Mage</i> =45 (36- 60) Managers of non-autistic intern: <i>n</i> =4 (1 female, 3 male); <i>Mage</i> =37 (33- 41)			autistic interns; clear communication and more consistent support were perceived to benefit both intern groups.	
Romualdez et al. (2021), UK	Semi- structured interviews	Individuals diagnosed with autism : <i>n</i> =24 (12 female, 12 male); <i>Mage</i> =45.70	Identify factors affecting disclosure outcomes and reasons for disclosure	Questions in the interview guide relatedf to employment background and diagnostic disclosure	Three themes were identified related to disclosure: (1) A preference for keeping my diagnosis private; (2) The importance of disclosure in the workplace; and (3)	Good (15/20), III

Author (year), Country	Study Design	Participants	Objective	Outcome Measures	Findings	Quality and Level of Evidence
					Disclosure has mixed outcomes. Three factors were found to be associated with disclosure outcomes: understanding of autism, adaptations, and organisational culture.	
Scott et al. (2015), Australia	Q-methodology	Individuals diagnosed with autism : n=40 (16 female, 24 male); Mage=29.1, SD=10.7 Managers of autistic employees: n=35 (19 female, 16 male); Mage=44.6, SD=10.4	Identify key factors for successful employment from the viewpoints of adults with autism spectrum disorder (ASD) and employers.	Work commitment, motivation, job confidence	Although autistic employees and employers appeared committed to the employment process, the difference in their understanding regarding the type of workplace support required, job expectations and productivity requirements continued to hinder successful employment.	Adequate (14/20), II

Author (year), Country	Study Design	Participants	Objective	Outcome Measures	Findings	Quality and Level of Evidence
Scott et al. (2018)	Scoping review	Employees diagnosed with autism in	Synthesize the extent and range of literature relating to the employment of individuals with autism spectrum disorder	Strengths and abilities of autistic employees and linked to the International Classification of Functioning Disability and Health Core Sets for autism	Randomised control trials and quasi- experimental evidence were found to support the effectiveness of employment interventions in adults with ASD in improving vocational skills, executive functioning in relation to job performance and employment status outcomes. Statistically significant improvements were reported for intervention participants compared to control participants across outcomes.	Strong (17/20), II

Author (year), Country	Study Design	Participants	Objective	Outcome Measures	Findings	Quality and Level of Evidence
Vogus & Taylor (2018), USA	Editorial	N/A	Taking an organizational perspective to studying autism at work	N/A	Diversity climate, psychological safety, and inclusive leadership is important for the employment outcomes of autistic employees.	Limited (8/20), V
Whelpley et al. (2020), USA	Survey with open ended items	Individuals diagnosed with autism: $n=65$ (48% female, 52% male); $M_{age}=31.50$ Non-autistic managers: $n=26$ (35% female, 65% male); $M_{age}=33.3$	Identify the shared autistic employee-organizational experiences or tensions during hiring and on the job and with work tasks, employee-manager interactions	Open-ended and Likert-type questions included in the survey	Autistic employees and their managers share similar views on disclosure, communication issues or misunderstandings, and management support. Underlying these categories was a desire for equal treatment and an unfortunate ignorance of what autism is.	Strong (16/20), III

Author (year), Country	Study Design	Participants	Objective	Outcome Measures	Findings	Quality and Level of Evidence
Whelpley & Perrault (2021), USA	Theoretical framework	N/A	To conceptualize the benefits and challenges of autism at work using a framework that includes internal and external factors	N/A	A framework that incorporates both the internal support that top management teams show for the integration of autistic individuals and the external visibility that can lead to their firm's social approval	Limited (10/20), V
Zolyomi et al. (2017), USA	Interviews, Q-methodology	Students diagnosed with autism or with an autistic identity: <i>n</i> =6 (4 female, 2 male, 1 transgender male) Staff of Student Disability Services: <i>n</i> =5 (4 female; 1 male)	Identify the technology needs of neurodiverse teams comprised of autistic and nonautistic students	Stages of teamwork, values of neurodiverse teamwork, neurodiverse teamwork experiences	Despite motivation to succeed, neurodiverse students have difficulty expressing individual differences and addressing team conflict.	Limited (5/20), II

Author (year), Country	Study Design	Participants	Objective	Outcome Measures	Findings	Quality and Level of Evidence
Zolyomi et al. (2018), USA	Interviews, Q-methodology	Students diagnosed with autism or with an autistic identity: <i>n</i> =6 (4 female, 2 male) Staff of Student Disability Services: <i>n</i> =5 (4 female; 1 male)	Identify values of autistic higher education students to inform collaboration technology for neurodiverse teamwork	Values of neurodiverse teamwork (freedom from stigma, social connection, individual comfort, team cohesion)	Using Value-Sensitive Design (VSD), key values of students with autism are: freedom from stigma, individual comfort, social connection, and team cohesion.	Good (15/20), II

Appendix B – Methodological Assessment

Standard Quality Assessment Criteria for Evaluating Primary Research Papers

		<i>Yes = 2 Partial = 1 No = 0</i>										
		Scott et al. (2015)	Morris et al. (2015)	Lorenz & Heintz (2015)	Remington & Pellicano (2018)	Zolyomi et al. (2017)	Zolyomi et al. (2018)	Bury et al. (2020)	Johnson & Joshi (2014)	Lindsay et al. (2019)	Romualdez et al. (2021)	Hagner & Cooney (2005)
		III	I	III	I	IV	II	I	V	II	II	III
Criteria for assessing the quality of qualitative studies												
1	Question / objective sufficiently described?	2	2	1	2	1	2	2	1	2	2	2
2	Study design evident and appropriate?	2	2	2	2	1	2	2	1	1	1	2
3	Context for the study clear?	1	2	1	2	1	2	2	2	2	2	1
4	Connection to a theoretical framework / wider body of knowledge?	0	1	1	2	0	1	1	2	1	1	1
5	Sampling strategy described, relevant and justified?	2	2	2	2	1	1	2	0	2	1	1
6	Data collection methods clearly described and systematic?	2	2	2	2	0	2	2	0	1	2	2
7	Data analysis clearly described and systematic?	2	2	1	2	0	2	2	0	1	2	1
8	Use of verification procedure(s) to establish credibility?	2	1	0	2	0	1	2	0	2	2	2
9	Conclusions supported by the results?	1	2	1	2	1	2	2	1	2	2	2
10	Reflexivity of the account?	0	0	0	0	0	0	0	1	0	0	0
	Total	70.0%	80%	55%	90%	25%	75%	85%	40%	70%	75%	70%
	Total	14	16	11	18	5	15	17	8	14	15	14
		Adequate (14/20)	Strong (16/20)	Adequate (11/20)	Strong (18/20)	Limited (5/20)	Good (15/20)	Strong (17/20)	Limited (8/20)	Good (14/20)	Good (15/20)	Adequate (14/20)

Standard Quality Assessment Criteria for Evaluating Primary Research Papers

		<i>Yes = 2 Partial = 1 No = 0</i>														
		Scott et al. (2018)	Annabi & Locke (2019)	Grenawalt et al. (2020)	Whelpley et al. (2020)	Bowman (2020)	Johnson et al. (2020)	Martin et al. (2022)	Parr et al. (2013)	Baldwin & Costley (2016)	Krzemińska (2019)	Holmes et al. (2020)	Annabi et al. (2017)	Vogus & Taylor (2018)	Whelpley & Perrault (2021)	Austin & Pisano (2017)
		I	II	III	I	IV	I	II	I	II	IV	IV	IV	IV	IV	
Criteria for assessing the quality of qualitative studies																
1	Question / objective sufficiently described?	2	2	2	2	1	2	2	2	2	2	2	1	2	2	2
2	Study design evident and appropriate?	2	2	1	2	0	2	1	2	1	1	1	1	2	2	2
3	Context for the study clear?	2	2	1	2	1	2	2	2	2	2	2	1	2	2	2
4	Connection to a theoretical framework / wider body of knowledge?	2	2	1	1	1	2	1	2	1	2	1	1	1	2	1
5	Sampling strategy described, relevant and justified?	2	2	1	2	0	2	1	2	2	0	0	0	0	0	0
6	Data collection methods clearly described and systematic?	2	2	2	1	0	2	2	2	2	0	0	0	0	0	0
7	Data analysis clearly described and systematic?	2	2	1	2	0	2	2	2	2	0	0	0	0	0	0
8	Use of verification procedure(s) to establish credibility?	2	0	1	2	0	1	2	2	1	0	0	0	0	0	0
9	Conclusions supported by the results?	1	1	1	2	0	2	2	2	1	2	1	0	1	2	1
10	Reflexivity of the account?	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
	Total	85%	75%	55%	80%	20%	85%	75%	90%	70%	45%	35%	20%	40%	50%	50%
	Total	17	15	11	16	4	17	15	18	14	9	7	4	8	10	10
		Strong (17/20)	Good (15/20)	Adequate (11/20)	Strong (16/20)	Limited (4/20)	Strong (17/20)	Good (15/20)	Strong (18/20)	Good (14/20)	Limited (9/20)	Limited (7/20)	Limited (4/20)	Limited (8/20)	Limited (10/20)	Limited (10/20)

Standard Quality Assessment Criteria for Evaluating Primary Research Papers

Yes = 2 Partial = 1 No = 0

Joanna Briggs Institute Hierarchy Of Scientific Evidence For Meaningfulness

	Baldwin et al. (2014)	Bury et al. (2020)	Johnson et al. (2016)	Remington et al. (2021)	
	III	II	I	I	
Criteria for assessing the quality of qualitative studies					
1	Question / objective sufficiently described?	2	2	2	2
2	Study design evident and appropriate?	2	2	2	2
3	Context for the study clear?	1	2	2	2
4	Connection to a theoretical framework / wider body of knowledge?	1	1	2	2
5	Sampling strategy described, relevant and justified?	1	2	2	2
6	Data collection methods clearly described and systematic?	1	2	2	2
7	Data analysis clearly described and systematic?	1	2	2	2
8	Use of verification procedure(s) to establish credibility?	1	0	2	1
9	Conclusions supported by the results?	2	1	2	2
10	Reflexivity of the account?	0	0	1	0
	Total	60%	70%	95%	85%
	Total	12	14	19	17

Adequate (12/20) Good (14/20) Strong (19/20) Strong (17/20)

	III	III	II	I	
Criteria for assessing the quality of quantitative studies					
1	Question / objective sufficiently described?	1	1	2	2
2	Study design evident and appropriate?	2	2	2	2
3	Method of subject/comparison group selection or source of information/input variables described and appropriate?	2	2	2	2
4	Subject (and comparison group, if applicable) characteristics sufficiently described?	2	2	2	2
5	If interventional and random allocation was possible, was it described?	0	0	N/A	N/A
6	If interventional and blinding of investigators was possible, was it reported?	0	0	N/A	N/A
7	If interventional and blinding of subjects was possible, was it reported?	0	0	N/A	N/A
8	Outcome and (if applicable) exposure measure(s) well defined and robust to measurement / misclassification bias? Means of assessment reported?	1	1	2	2
9	Sample size appropriate?	2	2	2	2
10	Analytic methods described/justified and appropriate?	1	1	2	2
11	Some estimate of variance is reported for the main results?	1	1	2	2
12	Controlled for confounding?	0	0	1	2
13	Results reported in sufficient detail?	1	1	0	0
14	Conclusions supported by the results?	2	2	0	2
	Total	68%	68%	77%	91%
	Total	15	15	17	20

Appendix C – Stakeholder Responses

Q23	Q1	Q1_4_TEXT	Q2	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11_1	Q11_2	Q11_3	Q12
#	Gender	Gender (comment)	Age	Ethnicity	ASD Diagnosis	ASD Diagnosis Age	Self-identify?	3+ months experience	Years Work Experience	Teamwork Experience Years	I offer unique or creative perspectives when it comes to problem solving.	Excellent attention to detail or focus are among my best qualities.	I am highly dedicated to their work and teams.	Based on your experiences, what are other strengths related to autism that benefit teamwork?
1	Male		40.00	European	Yes	9.00		Yes	13	13	4	4	4	Self motivated
2	Male		42.00	European	Yes	27.00		Yes	20	20	4	3	2	pattern/anomaly recognition
3	Male		23.00	European	No		Yes	Yes	2.6	=10/12	4	4	5	when to approach and in what way.
4	Male		43.00	Eastern (Arab,	Yes	40.00		Yes	22	21	5	2	5	Honesty, integrity, logical
5	Female		41.00	(e.g., Chinese,	No		Yes	Yes	20	20	3	4	4	beyond
6	Female		50.00	European	No		Yes	Yes	28	28	5	5	4	Perseverative interests
7	Female		26.00	European	Yes	24.00		Yes	10	5	5	4	5	body's cues and continuing to work through hunger
8	Male		43.00	African, Afro-	Yes	25.00		Yes	4	3		5	4	5 Money
9	Female		32.00	European	Yes	30.00		Yes	8	7		4	4	2 experiences compared to NT people
10	Male		54.00	European	Yes	54.00		Yes	38	25		5	5	5 deep knowledge base
11	Female		25.00	Asian	No		Yes	Yes	38	32		5	5	5 such that my professionalism is praised.
12	Female		24.00	(East Indian,	No		Yes	Yes	2	2		5	5	5 Sensitivity to others emotions, organization, direct communication
13	options that	woman	24.00	European	No		Yes	Yes	7	3		5	3	4 Innovation, lack of compliance with norms
14	Female		28.00	European	Yes	26.00		Yes	3	1		5	5	4 genuine honesty
15	Female		23.00	European	Yes	23.00		Yes	3	3		4	4	3 spaces and files), direct communication, critical thinking (for solving
16	Female		25.00	European	Yes	23.00		Yes	10	10		4	3	4 Ability to say what everyone wants to say but is to afraid to say directly
17	options that	Non-binary	19.00	(East Indian,	No		Yes	Yes	1	1		4	3	4
18	Female		33.00	European	Yes	31.00		Yes	0.29	3.5		5	5	5 concepts, both independently and while working on a team.
19	Female		37.00	European	No		Yes	Yes	10	5		5	3	4 Not caving to peer pressure or negative talk
20	Female		35.00	European	Yes	33.00		Yes	15	4		5	5	4 Spikes in my profile mean that I sometimes outperform expectations
21	options that	Non-binary	24	European	No		Yes	No						
22	Female		29.00	European	No		Yes	Yes	13	13		4	4	5 Pattern recognition
23	Male		31.00	European	Yes	31.00		Yes	9	9		5	4	5

Q23	Q13_1	Q13_2	Q13_3	Q14
#	I don't find it difficult to learn informal procedures and processes. (R)	Changes in team member roles and responsibilities do not bother me.	I have a different understanding of my team's dynamics than others.	Based on your experiences, what are some challenges related to autism that make it difficult to work in teams?
1	4	3	4	Change in personnel due to retirement
2	4	1	4	other people are more interested in status/power games than doing the work
3	4	1	5	people at once.
4	4	3	4	Hiding my ticks, making eye contact, emotional safety
5	3	2	4	can also be challenging, fear of being misunderstood
6	4	2	3	Some team members show lack of acceptance and grace
7	4	2	4	asking questions
8	1	4	5	Being good
9	3	4	3	periods of social interaction tiring.
10	2	2	4	on their part of a project.
11	2	1	4	certain processes, which can be cumbersome.
12	2	1	4	Overstimulation by changes, people pleasing tendencies making it hard to say no, burn out
13	1	4	3	In trouble for seemingly contradicting reasons because of the nuances between them, overtalking
14	4	1	4	bullying, misunderstanding what i'm trying to articulate
15	2	2	2	rude, not liking small talk (difficulty bonding with team), prefer being alone, have to mask a lot to get along
16	3	2	4	process information or don't want to give it in writing. I can also be very anxious and this prevents me from
17	2	2	4	I struggle with keeping a friendly tone of voice and it sometimes comes off as me being too bossy
18	4	2	4	Social anxiety during meetings, stress due to schedule changes, imposter syndrome.2
19	2	2	5	
20	1	1	5	verbal harassment
21				
22	3	3	5	Rigidity, personality misunderstandings
23	5	2	4	Harder to work with high level specifications (not enough detail provided by team members)

Q23	Q15_1	Q15_2	Q15_3	Q16
#	teracting with others in team settings makes me feel anxious or stressed.	Teamwork is a source of meaningful social connection.	I hide parts of my personality to fit in with the team.	What can team members and team leaders do to support autistic team members?
1	3	3	2	Assignments and not assuming
2	5	3	4	communicate clearly, in writing, without subtext
3	2	4	5	past for individual A, might not work for individual B
4	5	5	5	Promote emotional safety
5	4	1	4	Ensure to include them in discussion and validate their opinions
6	4	3	5	members of the team. Give them the opportunities to grow that you
7	5	3	5	asking direct questions
8	4	5	4	Helping with money
9	3	4	5	to avoid changing or scheduling meetings at the very last minute.
10	4	3	4	our backs. Try not to misinterpret what we say (often literal).
11	4	4	5	announce that they are autistic. Being able to accommodate
12	2	4	5	regular schedules check ins that are not out of the blue, adequate
13	4	3	3	Give grace, written rules and policies,
14	4	1	5	seconds isnt helpful for auto processing
15	4	2	4	possible, allow the accommodations like a private desk or noise-
16	4	2	3	to participate in social events that aren't relevant to the actual work
17	4	3	5	what I mean. For example if they think I am being hostile or bossy
18	5	2	5	members, and that we are task-oriented. Give us more time to think
19	2	2	5	Acknowledge that everyone is different and processes info differently
20	4	1	5	differences. I've been on teams where team leads spent ten times
21				
22	5	4	5	Be flexible
23	4	1	4	

Q23	Q17_1	Q17_2	Q17_3	Q18
#	Disclosure can lead to positive support from others.	Disclosure can lead to undesirable outcomes like stigma and discrimination.	the same regardless of who you disclose to (e.g., supervisor versus	How does disclosing/not disclosing impact the way you interact with others in a team?
1	3	3	3	Increase biases
2	1	5	3	they perceive you as disabled
3	4	4	1	difference but most importantly it can be negative. Additionally,
4	3	3	3	prevents me from disclosing. By not disclosing, my interactions
5	2	4	2	intentional or not, can leave subconscious imprints of inability
6	2	5	4	Have seen HR departments use voluntary self-disclosures as an
7	2	5	2	work
8	4	4	5	Good
9	3	5	1	sometimes talk about characteristics of my ADHD without calling
10	4	5	1	popular media, leading them to treat me like a child or not giving
11	5	5	1	accommodation for my specific symptoms without disclosing.
12	4	4	1	results in people around you being hyper sensitive and often
13	3	4	3	less competent on a good day
14	2	5	1	working there. Or vaccines get brought up
15	4	4	1	will be burdened with explaining adult autism to almost
16	4	2	2	They're curious to know about my experience and what they can
17	4	4	2	autistic since it would help them with how they maneuver
18	4	4	1	disclosed my autism during the first few weeks of employment to
19	1	5	5	I wouldn't ever do that
20	2	3	1	members. Team members tend to discriminate more than
21				
22	2	5	2	discrimination, "supportive" people actually not being
23	3	3	1	"can" in the previous question. It made it too difficult to answer

Q23	Q20_1	Q20_2	Q21	Q22
#	I can work effectively in an open plan office environment. (R)	Having control over lighting or external noise makes a difference in my ability to focus.	What other factors of the physical environment affects your productivity in teamwork?	What can organizations, team leaders, and/or team members do to support neurodiverse teams (e.g., autistic and non-autistic team members)?
1		3 3	Too much noise	Stop assuming and making biased decisions
2		4 4		people
3		2 5	quiet or loud, but it needs to be consistent. I can	on what neurodiversity means and may look like. 2. Be cognizant of their
4		5 5	Unpredictable interactions with colleagues	to some of the other recent activities around psychological safety, and
5		3 4	productivity	Being mindful of that individual's triggers ie. Lighting, noise sensitivity,
6		3 5	levels are distracting and produce anxiety. I	Most importantly an attitude of understanding and accommodation
7		5 5	others, not feeling comfortable listening to music	codes, secluded areas for stimming or decompressing
8		2 5	Good	Good
9		5 5	having more control over my physical	overlaps with previous questions.
10		4 5	people being too close, too hot/cold, blowing air,	from home option. Let us know the schedule. Be understanding if we don't
11		5 5	environment, but wearing earplugs or earphones	teams is to create an environment where a neurodiverse person would feel
12		4 5	regulation is also important, having the ability to	accessible, this means ensuring that there are different formats of delivery
13		5 4	possible but my music	adults
14		2 5	leave area vs a lunch room so I may decompress,	"more" or "less" autistic than another. One person with asd is one person.
15		4 4	people can't see me, I feel comfortable sitting in	neurodivergent team members, and not just the stereotypes and basics.
16		5 5	make me nauseated. Seeing lots of movement and	to attend social/team events that don't directly have to do with their job
17		3 4	checking to see where I'm at in the project. If I am	instead of implying things/leaving things up to common sense. Give direct
18		5 5	noise greatly impede my concentration. I will	non-autistic people, such as having clear guidelines for projects and tasks,
19		4 4		
20		5 5	Unplanned interruptions kill my productivity	of supporting them. I've never seen a bully get fired from a team
21				
22		5 5	temperature and other sensory control, access to	best environment for them specifically, flexible schedule
23		5 5	office you are assumed to be available which leads	

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