Emerald Studies in Workplace Neurodiversity

Generation A

Perspectives on Special Populations and International Research on Autism in the Workplace

Editors

Amy E. Hurley-Hanson, Ph.D.
Cristina M. Giannantonio, Ph.D.

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Emerald Studies in Workplace Neurodiversity

Series Editors: Amy E. Hurley-Hanson, PhD and Cristina M. Giannantonio, PhD

This important series is designed to make a significant contribution to the development of research on neurodiversity in the workplace. Despite increasing recognition of neurodiversity as a competitive advantage (Austin & Pisano, 2017), little is known about the work experiences and career outcomes of neurodiverse individuals. Neurodiversity is reported to include Autism Spectrum Disorder, Dyspraxia, Dyslexia, Attention Deficit Hyperactivity Disorder, Dyscalculia, Tourette Syndrome, and other neurological differences. This series will include books, monographs, edited volumes, and practitioner handbooks examining the key individual, organizational, and societal issues surrounding neurodiversity at work, the challenges involved in finding and maintaining employment for neurodiverse individuals, and the need to understand which best practices will lead to positive work, career, and life outcomes for neurodiverse individuals.

The series, *Emerald Studies in Workplace Neurodiversity*, will synthesize critical thinking around the strategic issues associated with hiring and integrating neurodiverse individuals into the workplace. Titles in the series will provide current research in this area. This series captures contemporary research and practice from a diverse range of international scholars, practitioners, and educators. The series will help to build connections between research and neurodiversity in the workplace.

The series will also explore the role of organizations, educational institutions, advocacy groups, and the public sector in preparing neurodiverse individuals for employment. It will also explore best practices being utilized in the employment process and how these may be adapted to address future challenges. This is a series that is relevant for both academics and practitioners, as it aims to further the research agenda on the topic and influence the ability of organizations to successfully hire neurodiverse individuals. While little is known about the work experiences and career outcomes of these individuals, the individual, organizational, and societal issues associated with neurodiversity in the workplace underscore the importance of this topic.

More information about the series is available at: https://books.emeraldinsight.com/page/series-detail/Emerald-Studies-in-Workplace-Neurodiversity/

Available Titles in This Series

Generation A: Research on Autism in the Workplace, edited by Amy E. Hurley-Hanson, PhD and Cristina M. Giannantonio, PhD

Generation A: Perspectives on Special Populations and International Research on Autism in the Workplace

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INVESTOR IN PEOPLE

Dedication

The day will come when the man at the telephone will be able to see the distant person to whom he is speaking.
Alexander Graham Bell

This book is dedicated to our families who showed us what the future might hold.

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About the Contributors

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Anna Hinder holds a Bachelor of Arts (Hons) from the University of Queensland and a Master of Commerce in Human Resource Management from the University of New South Wales. As the Principal of Searl Street Consulting, Anna works with leaders in professional services firms across Australia, New Zealand and Asia. Prior to consulting Anna held a range of human resource roles in Financial Services and Global Consulting across Australia, Asia and Europe. Her areas of interest include human resource management in profession services firms, social capital in professional groups and individual careers in professional services firms.

Jeff Larson is a PhD Student at the University of Arizona, USA. His research interests include interpersonal and prosocial sensemaking, compassion in the workplace, and health-care crisis management. Prior to entering academia, Jeff spent 20 years working in the health-care field, holding a variety of managerial and executive-level positions. Most importantly, for two decades Jeff balanced his working career with helping to raise his son Spencer, who had ASD. Spencer passed away in 2019.

Sneha Kohli Mathur, PhD, earned her doctorate in Education and Disability Studies from Chapman University, USA. Sneha is a Board Certified Behavior Analyst (BCBA) and has Bachelor's and Master's degrees in Psychology. Sneha considers herself an ally to the disAbility and Autism communities, and started Spectrum Success in order to support individuals on the autism spectrum, while educating "neuro typicals" on how to create a socially inclusive community. Sneha is a Faculty in the Psychology department of the University of Southern California (USC), where she teaches Master level courses in Applied Behavior

Analysis, and undergraduate courses related to Autism and Neurodiversity. Sneha is also a founding member of the Equity, Diversity, and Inclusion organization in ABA, a group that works towards social justice within the field of ABA in order to create a more inclusive platform for ABA practitioners and a more equitable future for clients. Her philosophy is to not only focus on working with her clients but also training employers and colleges to better create neurodiverse and inclusive spaces. Her future-focused approach allows her to help individuals build long-term success. Her research includes using a social model of disability to understand the adult transitional needs for individuals on the autism spectrum, as well as creating culturally responsive curriculum for behavior analysts. What makes Sneha's research, teaching, and consulting unique is her expertise in two very distinct areas, applied behavior analysis and disabilities studies. She is able to lay out behaviorally supported practices within a caring social-model context.

Zachary Maupin, PhD earned his doctorate in Education, with a School Psychology emphasis at Chapman University, USA. Dr Maupin has worked for the past several years as a school psychologist in Southern California. Dr Maupin maintains a regular assessment and counseling caseload while developing programs and procedures to support student's social, emotional, and behavioral needs. This role has involved all grade levels and included students from a variety of backgrounds. Dr Maupin's research interest areas include supporting transition and postsecondary opportunities for students with disabilities – particularly girls with autism. This work focuses on promoting an ecological and holistic perspective for each student and their surroundings while encouraging their future pursuits.

Ashley Molloy graduated from Trinity College Dublin with an MSc in Human Resource Management in 2019. Since then, she has been working for a nonprofit association with an HR team nominated for a CIH award in Excellence in Health and Wellbeing 2021. Ashley's main responsibilities include managing the full employee life cycle to ensure a high-level service for all stakeholders. Based on the excellent work, Ashley was awarded the Highly Commended Rising Star of the Year for CIPD, 2018.

Angel Miles Nash, PhD, is Assistant Professor of Leadership Development at Chapman University, USA. Angel taught and led in K-12 schools in Washington, DC, California, and Virginia, experiences which galvanized her research endeavors examining the emboldening of Black girls and women in the K-20+ educational pipeline, the professional intersectional realities of Black women in education, the ways that educators and educational leaders support underserved students in STEM education, and parent engagement. She has published in peer-reviewed journals and books, and her research has been funded by the Spencer Foundation, the Kay Foundation, and the American Educational Research Association. Angel's research, teaching, and service commitments collectively and intentionally reify her belief in educators' influence on the historically underserved communities on whose behalf she champions.

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Ashley O'Donoghue, PhD, is Head of Staff Learning & Development at TU Dublin, Ireland. She is an experienced academic-practitioner combining industry and academic experience in the areas of Organization Development and Equality, Diversity, and Inclusion (EDI). Her research focuses on leadership, employee emotions, well-being, and engagement at work, and this has informed her design and implementation of Leadership Development and Mentoring programs. Ashley believes that leaders play a key role in setting the tone and culture within an organization and have control over decision-making, policies, and resources that can enable a culture of equality and inclusion. https://orcid.org/0000-0002-5902-9268

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Karrie A. Shogren, PhD, is Professor in the Department of Special Education and Director of the Kansas University Center on Developmental Disabilities. Her research focuses on assessment and intervention in self-determination for people with and without disabilities across the life course. Shogren has published almost 200 peer-reviewed journal articles and more than 10 books on issues related to promoting and enhancing self-determination and inclusive supports for people with disabilities. She has received funding from multiple sources and been recognized for her contributions to the field by multiple professional and organizations.

Jacqueline H. Stephenson, PhD, is a Lecturer in the Department of Management Studies, University of the West Indies. Dr Stephenson read for a doctoral degree in Human Resource Management at the University of Nottingham (UK), and her research interests include equality, diversity, inclusion, and discrimination within the organizational context. She is a Reviewer for several academic journals and teaches undergraduate and doctoral courses in Human Resource Management, Human Resource Development, and Organizational Behavior. She is the coauthor of *Diversity, Equality, and Inclusion in Caribbean Organisations and Society: An Exploration of Work, Employment, Education, and the Law*.

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The idea for this book began before the advent of the pandemic in 2020. We could not have imagined the hardships the pandemic would create for our authors, including shutting down research sites, limiting the ability to conduct in-person interviews, restricting travel, closing campuses, infecting the authors and their families, and losing loved ones to COVID-19. Unprecedented weather throughout the world left some of our authors with flooded homes and no running water or electricity for weeks, while others were evacuated from their homes. We are grateful for their perseverance and dedication to completing their chapters and their commitment to creating a more inclusive workplace for members of Generation A. We thank them for their patience with us and for putting our deadlines ahead of their own during these challenging times.

Finally, neither of us could have produced this book alone. We are fortunate to be friends who work together and colleagues who are friends.

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Preface

Autism Speaks (2019) estimates that there are 3.5 million people with Autism Spectrum Disorder (ASD) in the United States. According to the Centers for Disease Control and Prevention, 2.2% of American adults have ASD and 18.5% of children are on the autism spectrum (CDC, 2020). Worldwide, the number of people affected by ASD is estimated to be in the tens of millions. Although it is difficult to get exact numbers, it is estimated that 1% of the world's population has autism (CDC, 2018; Grønborg, Schendel & Parner, 2013; Malcolm-Smith, Hoogenhout, Ing, De Vries, & Thomas, 2013).

The unemployment and underemployment rates for neurodiverse individuals, as compared to the general population, remain notably high (Baldwin, Costley, & Warren, 2014; Krieger, Kinebanian, Prodinger, & Heigl, 2012; Nord, Stancliffe, Nye-Legerman, & Hewitt, 2016; Richards, 2012; Roux et al., 2013; Scott, Falkmer, Girdler, & Falkmer, 2015; Shattuck et al., 2012). Unemployment statistics for adults with ASD reveal that 85% are unemployed and that 69% of them want to work (National Autistic Society, 2016). Research has shown that many individuals with ASD have never been members of the labor force (Cidav, Marcus, & Mandell, 2012). The statistics for young adults are particularly troubling, as it is estimated that half a million individuals with ASD will reach adulthood in the current decade and will be poised to enter the workplace in unprecedented numbers. These numbers suggest the need to examine the long-term employment, career, and life outcomes for this generational cohort. Hurley-Hanson, Giannantonio, and Griffiths (2020) introduced the term *Generation A* to refer to this generational cohort of young adults with ASD.

Labor market predictions suggest that there is a growing need for a skilled workforce in Science, Technology, Engineering, and Math (STEM) fields (U.S. Bureau of Labor Statistics, 2018). Neurodiverse individuals may be an ideal fit for this segment of the labor market as many possess the skill sets required of occupations in these fields (Crespi, 2016). The demand for talent in STEM fields is expected to dramatically increase as businesses and the economy return to pre-pandemic levels as vaccination rates increase and infection rates decline (Coy, 2021).

The high rates of unemployment highlight the costs to society of supporting unemployed individuals with ASD, the discrimination they face in the workplace, and the negative financial and social effects on family members. Sharpe and Baker (2007, p. 276) state that "Autism can be an expensive disorder." The annual costs of autism in the United States are estimated at $137 billion (Buescher, Cidav, Knapp, & Mandell, 2014). Leigh & Du (2015) estimated the combined annual

direct medical costs, nonmedical costs, and productivity costs of autism at $268 billion. They projected that these costs will reach $461 billion by 2025.These numbers are not unique to the United States. Internationally, autism is regarded as the most expensive disability (Byford et al., 2016; Clasquin & Clasquin, 2018; Hall, Wright, & Mills, 2016). In the United Kingdom, the total annual cost for children with ASD was found to be £2.7 billion ($4.3 billion US) while the costs for adults was £25 billion ($40.5 billion US) (Knapp, Romeo, & Becham, 2009). The national cost of ASD in Australia is estimated to range from $4.5 to $7.2 billion AUD (Horlin, Falkmer, Parsons, Albrecht, & Falkmer, 2014). In Scotland, MacKay, Knapp, and Boyle (2017) estimated the annual cost of ASD to be almost £2.3 billion.

Few disabilities appear to be more taxing on parents than ASD (Seltzer et al., 2009). "It can cost a typical family $60,000 per year and expenses are rising even further" (Guillot, 2013). Costs for the parents and families of individuals with autism include lost income, lost productivity, and missed career opportunities. In addition to lost salary, caregiving responsibilities influence a parent's ability to enter and remain in the workforce (Gould, 2004), whether they can work full time or part-time (Horlin et al., 2014), and the types of career opportunities that may need to be foregone. Thirty-nine percent of the parents of children with ASD reported that childcare problems had greatly affected their employment decisions, compared to nine percent of parents with neurotypical children. Parents of children with ASD score lower on a variety of measures of well-being than parents of children without disabilities, as well as parents of children with other types of disabilities (Abbeduto et al., 2004; Eisenhower, Baker, & Blacher, 2005). Adverse health outcomes for the parents of a child with ASD as compared to the parents of neurotypical children include high levels of stress (Hayes & Watson, 2013), depression (van Steijn et al., 2013), fatigue (Giallo, Wood, Jellett, & Porter, 2013), poor sleep (Meltzer, 2008), and self-rated poor health (Allik, Larsson, & Smedje, 2006). All of these issues may place emotional strain on family members and contribute to marriage difficulties such as abandonment, separation, or divorce. Parents of children with ASD may be more likely to divorce than parents of children without ASD due to high levels of stress and demands on time (Shapiro, Gottman, & Carrere, 2000; Shiono & Quinn, 1994). Some studies report divorce rates of 80 percent or more (Doherty, 2008; Hartley et al., 2006).

Other family members may also experience challenges. Siblings of family members with ASD are reported to have lower rates of social and emotional well-being (Wright, 2018). They may also have fewer social outings with peers and might find that their family is excluded from holiday events and gatherings. Grandparents of individuals with ASD have been found to experience stigma similar to that felt by parents and siblings (DePape & Lindsay, 2015; Hillman, Wentzel, & Anderson, 2017), as well as stress due to worry about their family (Margetts, Couteur, & Croom, 2006). Studies have found that 25% of grandparents helped with babysitting, respite care, financial resources, and transportation. Some grandparents also help by moving in with the family, postponing retirement, withdrawing retirement savings (Hillman, Marvin, & Anderson, 2016), or advocating for their grandchild (Hillman et al., 2017).

Finally, an emerging area of research is examining how those who identify as allies (both family and nonfamily members) are assisting individuals with ASD during the hiring process through advocacy strategies (Clark, 2019).

Little research has examined the effects of a diagnosis of ASD on individuals who traditionally have not been the focus of autism studies. For example, most studies on autism in the workplace have only examined a fairly small subset of occupational categories (e.g. STEM), with limited understanding of how ASD may influence the work experiences and career outcomes of individuals working in the medical, academic, and legal professions. More research is needed to understand how ASD affects members of various protected classes including age, gender, race, national origin, religion, sexual preference, and sexual identity.

While much autism research has focused on individuals with ASD in the United States, it is important to note that several important research studies are being conducted with international populations (Sarris, 2019). Much of the international research on ASD has focused on the effects of stigma on individuals and their families, and whether parents are willing to accept services that may help individuals with ASD to find work. Cultural differences surrounding the stigma of autism suggest that in some cultures, the stigma of autism is more pronounced than in others. While a diagnosis of autism may bring needed therapies and support, it may also result in stigmatization, being ostracized, and social rejection for the child and the family (Sarris, 2019). Baker (2013) found that many children with autism in South Korea had not been diagnosed and had not received any special services. In Korean culture, many parents of a child with autism worry that their other children will not be able to find spousal partners. A study in Great Britain found that parents were reluctant to have their child diagnosed, and although they knew the benefits of treatment, they were afraid of rejection and stigma (Russell & Norwich, 2012). A study in Israel found that caregivers of people with autism felt more stigmatized than caregivers of those with physical or intellectual disabilities (Werner & Shulman, 2013). Schools in Japan began offering special education for students with developmental disorders in 2007 and found that parents were very reluctant to allow their children to participate in those programs for fear of the stigma (Russell & Norwich, 2012). A study in Hong Kong found that the parents of children with ASD had very high levels of internalization of stigma (Mak & Kwok, 2010).

Another focus of international research has been workplace discrimination faced by individuals with ASD. The United Nations has noted the widespread discrimination in the workplace against people with autism and the limited vocational training and job opportunities available to them. Most discrimination lawsuits against organizations have focused on recruitment practices and lack of accommodations for individuals with ASD. A 2017 British case (Government Legal Service v Brookes [2017]) found that the employer was fined because an individual with Asperger's was required to take a multiple-choice test, placing an unjustified requirement on the applicant. This was unlawful indirect disability discrimination. Other legal issues that arise in the workplace have involved reasonable accommodations, workplace bullying, failure to adjust company policies, companies' lack of understanding of how the employee's disability might

affect their job, perceiving a negative effect on the employee's performance due to their disability with no actual data to support this, and termination of an employee based on beliefs regarding the disability. Employment laws protecting individuals with ASD and other disabilities vary widely from country to country. Violations of these laws have long-term effects on the work experiences and career outcomes experienced by individuals with ASD, as well as implications for organizational practices and Human Resource Management policies in those countries. Future research on ways to mitigate the discrimination and stigma experienced by individuals with ASD may enable corporations to successfully create organizations that allow for the successful employment of individuals with ASD.

It is within this context that chapters were selected to be included in this edited volume. Several chapters focus on understanding the perspectives of special populations within Generation A, while other chapters focus on international research on autism in the workplace. These chapters capture contemporary research and practice from a diverse range of international scholars, practitioners, and educators, with the goal of building connections between research and practice focused on issues of neurodiversity in the workplace. It is hoped that future research on neurodiversity in the workplace will discover best practices that will lead to positive work, career, and life outcomes for members of Generation A and neurodiverse individuals.

Amy E. Hurley-Hanson, PhD and
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Introduction

This book is part of the *Emerald Studies in Workplace Neurodiversity* series. This series focuses on making significant contributions to the development of research on neurodiversity in the workplace and will capture contemporary research and practice from a diverse range of international scholars, practitioners, and educators. The series is intended to build connections between research and issues of neurodiversity in the workplace.

This book explores ways that researchers can help facilitate finding and maintaining employment for individuals with Autism Spectrum Disorder (ASD). The authors explore the role of organizations, advocacy groups, and the public sector in preparing neurodiverse individuals for employment. The chapters included in this volume specifically focus on the transition, work, and career experiences of Generation A. Hurley-Hanson et al. (2020) introduced the term Generation A to refer to the 500,000 young adults with ASD that will be poised to enter the workplace in the current decade. The chapters included in this volume are organized and presented along two themes: *Special Populations Affected by Generation A* and *International Research on Generation A*.

The first theme, *Special Populations Affected by Generation A,* explores the experiences of special populations within the generational cohort of Generation A. Chapters in this section of the book explore the growth of STEM occupations and how this growth may create opportunities for women members of Generation A. Other chapters in this section examine the career and life effects of being a parent of a young adult with ASD, the role of allies in supporting the efforts of young adults with ASD to find and maintain successful employment, and the unique career experiences of individuals with ASD in the legal profession.

The chapter entitled *Creating Career Opportunities for Women with Autism in STEM* (Chapter 1) by Amy Jane Griffiths, Angel Miles Nash, Zachary D. Maupin, Raquel Delgado, and Sneha Kohli Mathur explores the intersection between STEM occupations and the special population of women who are members of Generation A. The authors note that over the next 25 years, STEM (science, technology, engineering, and mathematics) occupations will increase at rates higher than those in any other professional field. The inevitable rise in career opportunities, and the multiplicative impact across technology in a wide range of fields, will continue to create gaps that can and should be filled by professionals with diverse skill sets. The authors argue that it is essential to increase equitable access to future available jobs for historically underserved populations, such as women with autism, as they possess skills and perspectives that offer different

approaches to job tasks in STEM fields. This chapter brings much-needed attention to the interventions that employers can and should enact to support the women of Generation A. The FACES framework (Facilitation, Awareness, Connection, Exposure, Support) is offered as a guidepost for organizations that endeavor to support women with autism in professional preparation and on-the-job development.

The chapter entitled *Workplace Experiences of Parents of Children with ASD* (Chapter 2) by Jeff Larson discusses the significant professional strain that having a child with ASD can cause parents. The author suggests that compared to parents of typically developing children or children with other types of special needs, parents of children with ASD report being underemployed, having more difficulty accomplishing important work tasks or taking on new work assignments, and being viewed less favorably by supervisors. Research on this special population also suggests that they may be more likely to perceive themselves as stigmatized by coworkers, negatively impacting their abilities to develop or maintain meaningful relationships with others at work. All of these factors lead to parents of children with ASD earning less annual income than other types of parents and being more likely to experience loss of workplace motivation or lower overall job satisfaction. The negative career experiences of parents of children with ASD may also impact employers. Employees experiencing lower motivation levels are less productive and more likely to quit their jobs, resulting in increased turnover expenses. Because the number of working parents of children with ASD will continue to grow as ASD rates increase, organizations would benefit from supporting parents of children with ASD through adopting flexible work–life balance policies, encouraging leaders to promote values of diversity and inclusiveness, and implementing workplace programs designed to support parents and educate coworkers.

The chapter entitled *Career Progression: Strategies used by self-advocates with ASD and their allies* (Chapter 3) by Christine L. Nittrouer, Evan E. Dean, and Karrie A. Shogren examines the efficacy of allyship strategies used to support job seekers with ASD to communicate with potential employers. The research presented in this chapter assesses self-advocates with ASD and supporters of people with ASD (e.g., family members, caregivers, employment specialists, vocational rehabilitation professionals) about the advocacy strategies they have implemented during the hiring process to enhance communication with employers. Study participants rated the effectiveness of the strategies that others may use and the strategies they have used when seeking employment for an open position. A variety of psychological variables (e.g., self-determination, self-advocacy, global self-esteem, mentorship, incivility) suspected to influence the use of these strategies in seeking employment were measured. Findings from this research inform effective support and advocacy strategies as well as ways that varying psychological variables predict the use of these strategies, allowing for the personalization of interventions and support for self-advocates and allies.

The chapter entitled *Stellar Evolution: Career paths of autistic professionals in corporate law firms* (Chapter 4) by Anna Hinder examines the career experiences of lawyers in professional services firms. Her study gives a unique insight

into the career experiences members of Generation A are likely to encounter as they enter the workforce in professional service firms. This chapter describes the features of professional service firms and their talent management systems to suggest that private practice legal work provides a career that is well suited to the preferences of many autistic professionals. In law firms, the focus has been on improving the career experiences of current neurodiverse employees who may or may not have a formal diagnosis in both entry level and senior roles. There are unique challenges for employees, their teams, and law firms that employ adults with ASD. These challenges are explored across the career stages of a legal professional as they develop expertise and make the transition from graduate to partner.

The second theme, *International Research on Generation A,* explores the experiences of Generation A from an international perspective. The countries represented are India, Great Britain, Ireland, and Trinidad and Tobago. The chapters explore various ways that individuals with ASD and members of Generation A are being included in organizations in these countries. The authors describe areas where the employment of Generation A is not currently being addressed and suggest the types of accommodations that will be needed to facilitate Generation A's entry into the workforce in their countries. The legal issues associated with hiring individuals with ASD, as well as efforts by nongovernmental organizations (NGOs) to facilitate their employment, are also discussed by these authors.

The chapter entitled *Enabling Neurodiversity in the Workplace via Inclusive Human Resource Practices* by Ashley Molloy, Ashley O'Donoghue, and Na Fu (Chapter 5) notes that the employment rate of individuals with ASD remains very low, that access to services and support for them is inadequate globally, and that research on understanding neurodiversity-based employment and its success factors is quite limited. This chapter aims to fill this important gap by exploring inclusive human resource practices being adopted by companies that are neurodiversity champions. The authors report the results of interviews that were conducted with six Irish organizations to identify their neurodiversity and autism practices. Their chapter also offers a theoretical and practical assessment of the needs and challenges faced by neurodiverse employees and outlines a set of human resource management practices that are required to create an inclusive work environment to attract and retain neurodiverse workers. In addition, they cover the opportunities and obstacles of Generation A in their countries and how organizations are working to become more inclusive.

The chapter entitled *Autism, Generation A, and the Workplace: The Policy, Legal and Institutional Framework in Trinidad and Tobago* (Chapter 6) by Natalie Persadie argues that neurodiverse conditions and developmental disorders are neither well known nor understood by the general population in Trinidad and Tobago. In particular, awareness of and sensitivity toward children with ASD are lacking. Given the current challenges faced by persons with ASD in securing and maintaining employment and the fact that this is a generally underexplored area of research, focusing on Generation A provides an opportunity to explore what provisions are in place for individuals with ASD to assist with future transitions

into the workplace in Trinidad and Tobago. This chapter focuses on the existing policy, legal, and institutional framework in Trinidad and Tobago to determine how ASD in the workplace is currently addressed and what accommodations are being made to facilitate this demographic. A review of ASD-related data and select, relevant policy, law, and institutions in Trinidad and Tobago revealed that very few preparations, if any, are being made to facilitate members of Generation A's entry into the workplace. The most relevant sector for addressing ASD needs falls to the NGO movement, although these organizations do not focus on employment preparation. Several recommendations for key stakeholders in this process are presented that may assist with these issues.

The chapter entitled *Efficacy of Anti-Discrimination Legislation – The case of autism spectrum disorder* by Jacqueline H. Stephenson (Chapter 7) examines attempts to eliminate and minimize employment discrimination against individuals with ASD in the United Kingdom. Stephenson argues that the passage of legislation has proved instrumental, not only in containing the perpetration of discrimination based on protected grounds but also in increasing awareness of the disadvantages which result from the disparate treatment meted out to persons as a result of their immutable characteristics. Disabilities are one such area where legislation exists to prohibit disparate treatment in employment, education, and the provision of goods and services. The chapter analyzes a sample of discrimination cases in the United Kingdom by claimants who have alleged discrimination based on their diagnosis of autism or a related disorder within the autism spectrum.

The chapter entitled *Generation A: Life perspectives, potentials, challenges, and future of neurodiverse stars in India* by Sumathi Annamalai and L R Niranjan (Chapter 8) focuses on the Indian experience in the neurodiversity landscape. The chapter explores the lifestyles of a select number of successful neurodiverse rock stars in India and their journeys from becoming aware of their profile to establishing a career and becoming role models to other people with ASD. The chapter covers the autism landscape in India and explores business organizations in India that have hired people with ASD, their policies connected to neurodiversity, and the organizations that provide training and support to individuals with ASD. The chapter covers the opportunities and the challenges faced by individuals with ASD in India as well as the role of different stakeholders in providing support and training to this population.

In summary, we believe that this book offers insights into the transition, work, and career experiences of the young adults with ASD who comprise Generation A. This book brings together international scholars, practitioners, and educators who are researching Autism in the Workplace with a particular emphasis on Generation A in their home countries, as well as special populations within Generation A. The chapters presented in this volume offer researchers, educators, and practitioners several avenues for smoothing the transition from educational settings into the workplace for Generation A, whose members are poised to enter the labor market, eager to work, and able to achieve positive work experiences and life outcomes. This book provides several new contributions to both the disabilities literature and research on special populations and the international

context. These two important areas are often overlooked in research on ASD in the workplace. This book has the potential to reduce the stigma associated with ASD, change image norms surrounding ASD, and facilitate integrating individuals with ASD into the workforce. Hopefully, this book will be a valuable resource for individuals with ASD, as well as their families and caregivers. It will also be an important resource for organizations interested in obtaining the benefits of hiring people with ASD and for advocacy groups supporting the transition and employment needs of individuals with ASD.

Amy E. Hurley-Hanson, PhD and
Cristina M. Giannantonio, PhD

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Part I
Special Populations Affected by Generation A

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Chapter 1

Creating Career Opportunities for Women with Autism in STEM

Amy Jane Griffiths, Angel Miles Nash, Zachary D. Maupin, Raquel Delgado and Sneha Kohli Mathur

Abstract

Over the next 25 years, STEM (science, technology, engineering, and mathematics) occupations will increase at rates higher than those in any other professional field. The inevitable rise in career opportunities, and the multiplicative impact across technology in a wide range of fields, will continue to create gaps that can and should be filled by professionals with diverse skill sets. It is essential to increase equitable access to future available jobs for historically underserved populations, such as women with autism, as they possess skills and perspectives that offer different approaches to job tasks in STEM fields. Considering the intersectional barriers that women face in the workforce, we have written this chapter to bring much needed attention to the interventions that employers can and should enact to support the women of *Generation A*. We offer the FACES framework (Facilitation, Awareness, Connection, Exposure, Support) as a guidepost for companies and organizations that endeavor to support women with autism in professional preparation and on-the-job development. We corroborate our framework recommendations with labor market data that offers insight into future projections regarding STEM fields and the associated opportunities and careers.

Keywords: STEM workforce; women with autism; labor market; workforce diversity; women with disabilities; careers in STEM; autism; employability skills; labor market trends; diverse workforce

In 2017, over 156 million jobs were available in the United States, with an estimated 0.7% annual increase expected over the next 10 years (U.S. Department of Labor, 2017a). Fifteen percent of these jobs are within Science, Technology,

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Engineering, and Math (STEM) disciplines (U.S. Department of Labor, 2017b). Over the next 25 years, it is expected that these occupations will continue to grow at faster rates than nearly all other professional fields (U.S. Department of Labor, 2018a). This fast-paced evolution will continue to introduce changes to the workforce and preparation efforts for those transitioning into it. Undeniably, a competitive and automated future job market will require new skills and alternative methods for equipping aspiring employees to participate in expanding STEM fields (World Economic Forum, 2018).

Due to emerging complexities that young people face when transitioning into the changing workforce, certain populations are often neglected; historically, this has affected women (Noonan, 2017) and individuals with disabilities (Griffiths, Giannantonio, Hurley-Hanson, & Cardinal, 2016). The term "double jeopardy" has been used to describe the gendered and ability-based disadvantages *women with disabilities* face when pursuing further education or career transition (Harley, 2011). In this pipeline of inequities, women with autism face significant disadvantages and difficulties when pursuing STEM opportunities.

This chapter will explore and discuss ways to support this neurodiverse population in STEM careers. Women with autism are severely underrepresented in the current STEM workforce literature. By reviewing the challenges both women and individuals with autism have faced in STEM fields, we provide recommendations for identifying and supporting the unique needs of women with autism in STEM.

Women in STEM

Historically, women with or without disabilities have struggled to access the STEM workforce. While progress has been recognized over time, the twenty-first century has seen considerable neglect for women with less education (Black, Whitmore Schanzenback, & Breitwieser, 2017). The noted decrease in women's participation in the labor force, most apparent after 2000, is a result of several factors, including the aging population and access to educational opportunities (Council of Economic Advisors, 2015). Recent reports from STEM-related disciplines have indicated women represent 28.4% of positions in science and engineering occupations, 26% of computer scientists, 17% of tenured/tenure-track engineering faculty, and 13% of engineers (National Science Foundation, 2017; Society of Women Engineers, 2018). The impact of this underrepresentation reaches past neglect and reflects inequitable practices for all women. It also has a significant detriment on economic growth as a whole (Bandara, 2015). With 76% of STEM-related fields being occupied by male employees in 2015, clear disproportionality exists in STEM (Noonan, 2017).

Individuals with Autism Pursuing STEM

Autism is formally categorized as a neurodevelopmental disability under Autism Spectrum Disorders (ASD) in the most recent edition of the *Diagnostic and*

Statistical Manual of Mental Disorders (DSM) (American Psychiatric Association, 2013). The challenges that individuals with autism experience are well-documented. They include challenges with social skills, both verbal and nonverbal communication struggles, restrictive interests, repetitive behaviors, the need for sameness and routine, and difficulty understanding others' intentions or emotions. People with autism may demonstrate rigid thinking and process information in exact, less flexible terms. The degree to which these characteristics are present varies by individual and can manifest in a range of ways (Masi, DeMayo, Glozier, & Guastella, 2017).

With recent studies observing an increase in the classification of autism, it is estimated that 50,000 young adults with autism will soon be transitioning out of K–12 school services and into adult life (Baio et al., 2018). Over the next 10 years, close to half-million people with autism will reach adulthood; this generational cohort is referred to as *Generation A* (Hurley-Hanson, Giannantonio, & Griffiths, 2020). The estimated cost of supporting and servicing this population has exceeded $268 billion in the United States and is expected to reach $461 billion by 2025 (Leigh & Du, 2015). Parents of children with autism report high expenses and costs of care that only increase when students reach adulthood and are faced with unemployment. Despite individuals with autism possessing the capacity and desire to pursue employment, approximately 80% are unemployed (Hendricks, 2010; National Autistic Society, 2019). As a result, adults with autism often report lower levels of life quality, financial outcomes, and daytime activities (Taylor & Seltzer, 2011). Employment is recognized as a crucial milestone in adulthood that is critical to enhancing one's self-concept, persistence, and adaptability (Zikic & Hall, 2011); additionally, it provides access to life essentials and socialization.

Little documentation exists regarding the unique abilities and perspectives that employees with ASD can offer a marketplace in need of skilled workers. However, traits commonly seen as strengths in individuals with autism are related to visual acuity, more deliberative decision-making, increased attentional focus, logical thinking, an affinity for technology, and professional and occupational interests in STEM fields (Crespi, 2016). STEM fields, in particular, present a growing need for a skilled workforce in these areas, potentially giving individuals with autism an ideal fit for this sector of the labor market (U.S. Department of Labor, 2020a). However, despite these unique skills, effectively transitioning into the workforce can be challenging and often results in unfavorable outcomes.

Individuals with disabilities are marginalized in the workforce, and only 21% report being gainfully employed (U.S. Bureau of Labor Statistics, 2018b). Individuals with disabilities have comprised as little as 7% of the workforce in select STEM disciplines and face unprecedented barriers, along with women and minority ethnic and racial groups (National Science Foundation, 2017). Additionally, teachers of STEM topics often struggle to disseminate and facilitate instruction in an inclusive manner for individuals with disabilities (Lee, 2011). Despite emerging practices encouraging the development of STEM skills for individuals with disabilities, their journey remains long and arduous (Bellman, Burgstahler, & Chudler, 2018; Schreffler, Vasquez, Chini, & James, 2019).

No exception is provided to individuals with autism in their career pathways as their distinct needs and skills are often viewed as shortcomings. This is evident in a national sample representing individuals with autism in special education that found only 32% of individuals with autism were enrolled in 2- or 4-year colleges (Wei, Yu, Shattuck, McCracken, & Blackorby, 2013). Conclusions from this study found that among 11 disability categories, young adults with autism were least likely to enroll in college, the only exception being individuals with intellectual disabilities. Despite clear disproportionality in college settings, it is recognized that a relatively higher percentage of individuals with autism elect to pursue select STEM majors compared to other disability classifications and the general population (Wei, Yu, Shattuck, & Blackorby, 2017). However, a substantial gap continues to linger as men with autism are 13 times more likely to engage in STEM majors than women with autism (Wei et al., 2013).

Unfortunately, even once a job is obtained, maintaining employment is challenging for individuals with autism. Difficulties with interpersonal skills and interpreting workplace dynamics may lead to increased stress or conflicts (Hayward, McVilly, & Stokes, 2018; Richards, 2012). Research has shown that individuals, a majority being males, who had fewer traits of autism, less maladaptive behaviors, and were not diagnosed with comorbid intellectual or cognitive deficits, were more prone to positive vocational outcomes (Eaves & Ho, 2008; Taylor & Seltzer, 2011). Apart from these traits, being a woman with autism presents further substantial obstacles for pursuing STEM fields. There is an acknowledged lack of research on the topic of women with disabilities in STEM, with the population of women with autism having little-to-no research available (Griffiths, Miles Nash, Maupin, & Mathur, 2020). Due to this disparity, we are compelled to begin by analyzing women in STEM and women with autism in an effort to recognize and encourage positive outcomes for women with autism pursuing STEM.

Women with Autism

Prevalence studies have consistently claimed that autism affects 4.5 times as many men as women, identifying 1 in 42 men compared to only 1 in 189 women (Baio et al., 2018; Fombonne, 2009). However, when observing individuals with more functional difficulties and comorbid intellectual disabilities, the ratio of men to women with autism is projected to be closer to 2:1 (Kirkovski, Enticott, & Fitgerald, 2013). Alternatively, when considering individuals with autism with average to superior intellectual abilities, identification rates are speculated to be as high as 6:1 (Fombonne, 1999) or even 10:1 (Dworzynski, Ronald, Bolton, & Happé, 2012). Recently, the accuracy of these prevalence patterns has been challenged with meta-analyses suggesting a consistent 3:1 ratio across the autism spectrum (Loomes, Hull, & Mandy, 2017). This disproportionality of women and men across the autism spectrum suggests the potential for a large portion of women to be left unidentified.

Attempts to establish factors that contribute to this diagnostic disproportionality have led to interesting findings regarding the profiles and traits of women with autism. Typically, autism is more commonly recognized in women with comorbid intellectual disabilities or more significant struggles with social and communication skills (Begeer et al., 2013). Although traits of autism are often identified within a similar timeframe as men, these concerns are quickly dismissed if not accompanied by subsequent difficulties (Horovitz, Matson, Turygin, & Beighley, 2012). Further considerations suggest that different or varying traits of autism may be present in women, contributing to misdiagnosis or being identified at a much later age, potentially in adulthood (Baldwin & Costley, 2016; Kreiser & White, 2015; Mandy et al., 2012).

Areas of special interests, or fixations consistent with symptoms of autism, can be less pronounced in women. These topics are often similar to their neurotypical peers (e.g., celebrities, pets, or animals) but are present to an unusual degree (Milner, McIntosh, Colvert, & Happé, 2019). Fewer stereotyped and repetitive behaviors may present and may manifest differently (Tint & Weiss, 2018). Additionally, women with autism tend to remediate social difficulties inherent to autism by reciprocating in conversation, imitating social dynamics, and being more motivated to initiate friendships despite ongoing social difficulties. These characteristics in women amount to what is known as "camouflaging" their symptoms, which, in turn, may contribute to underrecognized prevalence and later diagnosis (Milner et al., 2019). It is speculated that sociocultural factors also play a role as parents appear to uphold higher expectations for socially desired behaviors in girls, leading to more pressure to act within social boundaries (Holtmann, Bolte, & Poustka, 2007). Taken together, these findings suggest that women may present an alternative phenotype for autism than men (Milner et al., 2019). There is a severe paucity of literature available on this subject, apart from the acknowledgment that this is an unrecognized and neglected population (Kirkovski et al., 2013).

After accounting for varying degrees of autism traits, maladaptive behaviors, or cognitive and intellectual capacity, women with autism are distinguished as the most underrepresented demographic in STEM (Taylor, Henninger, & Mailick, 2015; Wei et al., 2013). There was an observed decline over 10 years regarding the vocational pursuits of women with autism when compared to men (Taylor & Mailick, 2014). Inequities that women with disabilities face in the workplace result in wage gaps, differential opportunities, and daunting vulnerabilities, including unemployment, underemployment, negative work experiences, increased workplace demands, and increased work insecurities (Harley, 2011).

Modern sociocultural, communal, and interpersonal systems are nuanced with obstacles and challenges that discriminate against women with disabilities pursuing STEM (O'Day & Foley, 2008). Among these norms are stereotype threats, implicit biases, insufficient professional services, and a lack of literature to guide and target effective outcomes for women with disabilities. Tint and Weiss (2018) analyzed themes from interviews with a focus group of 20 women with autism to identify consistent trends or barriers. These women expressed that their needs were frequently neglected, misunderstood, and not matched with effective

services, specifically in the areas of mental health, residential support, and vocational or employment services.

Bridging the Gap

As employers in STEM disciplines seek more diverse workforces and those who possess skills to respond to the changing and increasingly competitive field, individuals with autism are uniquely positioned as future contributors. Akin to the previously discussed traits of autism, common tendencies associated with autism have been used to explain an affinity toward topics related to STEM. One such theory, the Empathizing–Systemizing (E–S) theory, recognizes that individuals with autism are more prone to operationalizing, or systemizing, content when other neurotypical individuals may lead with more emotional explanations (Baron-Cohen, 2006, 2009). Systemizing is understood as the tendency to perceive or analyze content with categorical rules and explanations, while empathizing relies on social and emotional prospects that guide understanding. As companies understand and accommodate the unique needs and traits of individuals with autism, these intrinsic qualities, or attributes, may prove advantageous in STEM fields.

Some studies have also found that individuals with autism report having higher interests in technology and STEM than control groups. This population has performed better on various visual tasks with heightened visual abilities, such as perception and discrimination (Brosnan, Gwilliam, & Walker, 2012). Greater attentional detail and attentional focus are additional inherencies to autism that are seen as potential benefits to STEM positions (Smith & Milne, 2009). Individuals with autism show a more circumspect and logically consistent style of decision-making (Brosnan, Chapman, & Ashwin, 2014); this may contribute to social difficulties but function as a strength in STEM. However, it is important to note that some stereotypical perceptions of individuals with autism having inherent STEM abilities are often exaggerated by media sources, and studies suggesting a link between autism and STEM have focused primarily on children with autism in families with STEM careers (Wei et al., 2013).

Data Collection: Current Labor Market Trends for General and ASD-Related Skills

Data Collection Procedures

In a previous study (Walrod & Walrod, 2018), occupational data were analyzed from over 90 different state and federal sources, including the Bureau of Labor Statistics (BLS), the State of California, Integrated Postsecondary Education Data Systems (IPEDS), US Census, American Community Survey (ACS), and O*NET. Job postings, employees, resumes, and online profiles were also analyzed to determine the most in-demand jobs, industries, and experience requirements for occupations that match a skill or set of skills. Using ASD skills identified in the