

A MACRO-ENVIRONMENTAL ANALYSIS OF COMPETITIVE EMPLOYMENT
FOR INDIVIDUALS WITH AUTISM SPECTRUM DISORDER

by

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DEDICATION

To Willem, who outshines the morning sun.

To Elizabeth, who will compel the world to include women in the sequel.

To Tania, best of wives and best of women.

You will come of age with our young nation

We'll bleed and fight for you, we'll make it right for you

If we lay a strong enough foundation

We'll pass it on to you, we'll give the world to you

And you'll blow us all away

Someday, someday

Yeah, you'll blow us all away

Someday, someday

- Lin-Manuel Miranda

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LIST OF ABBREVIATIONS

Abbreviation	Description
ACA	Affordable Care Act
ADA	Americans with Disabilities Act
ADAAA	Americans with Disabilities Act Amendment Act of 2008
ADHD	Attention Deficit Hyperactivity Disorder
ADOS	Autism Diagnostic Observation Schedule
AI	Artificial intelligence
ASAN	Autistic Self Advocacy Network
ASD	Autism Spectrum Disorder
CDC	Center for Disease Control and Prevention
DSM	Diagnostic and Statistical Manual of Mental Disorders
DSM-5	Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (2013)
DSM-IV-TR	Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (text revision) (2000)
EAHC	Education for All Handicapped Children Act
EEOC	Equal Employment Opportunity Commission
ES	Employment Service
FLSA	Fair Labor Standards Act
GDP	Gross Domestic Product

HSM	Hart Schaffner Marx
IEP	Individualized education program
ID	Intellectual disability
IDEA	Individuals with Disabilities Education Act
JWOD	Javits–Wagner–O'Day Act
HHS	Department of Health and Human Services
NLTS-2	National Longitudinal Transition Study-2
NPR	National Public Radio
PDD-NOS	Pervasive developmental disorder–not otherwise specified
PEST	Political, environmental, social, and technological
SBA	Small Business Administration
SSDI	Social Security Disability Insurance
SSI	Supplemental Security Income
SWOT	Strength, weaknesses, opportunities, and threats
TWWIIA	Ticket to Work and Work Incentives Improvement Act
VR	Vocational Rehabilitation
WIA	Workforce Investment Act
WIOA.	Workforce Innovation and Opportunity Act

ABSTRACT

Society's understanding and awareness of autism spectrum disorder have evolved tremendously in the last decades as prevalence numbers have increased dramatically. Much of the research into autism has been focused on interventions, biology, and surveillance, with only a small fraction of funding and research going to lifespan and employment issues. There is no comprehensive multidisciplinary perspective that captures the threats and opportunities to build a neurodiverse workforce.

Some thirty years after the implementation of the Americans with Disabilities Act, the workforce participation rate and the employment rate of people with disabilities remains much lower than the general population. Unemployment rates for individuals on the spectrum have been estimated at 50 to 75 percent and youth with autism are among the least likely to be employed compared to peers with other disabilities. Competitive employment is associated with positive quality of life outcomes.

This thesis will present a multidisciplinary scoping review of the existing research on employment and autism within the political, economic, social, and technological macro domains. The purpose is to gain an understanding of the forces shaping the competitive employment environment for people on the spectrum with a particular focus on small business. The review yields a summary of threats and opportunities, provides recommendations for increased and inclusive employment for people with autism, and identifies research gaps and future research opportunities.

1. INTRODUCTION

The world needs all kinds of minds as the title of the 2010 TED talk by Temple Grandin boldly proclaims. Grandin urges the audience to take an interest in developing the “smart, geeky, nerdy kids” that “just aren’t very social” (Grandin 2010). Society’s understanding and awareness of autism spectrum disorder (ASD) have evolved tremendously in the last two decades and neurodiversity as a concept is starting to take hold in popular culture. Television shows like *Big Bang Theory*, *The Good Doctor* and even *Sesame Street* have recently introduced characters on the spectrum. Even in the workplace, companies like SAP and Microsoft are leading the charge in celebrating neurodiversity. Although these large enterprises have been getting the media spotlight for their promising efforts in inclusive hiring of people with ASD, these programs are but a drop in the bucket to solve the challenges of inclusive employment on a national scale. And autism cannot be fully or solely explained with smart, geeky, yet unsocial kids. The spectrum is broad and the nuances aplenty.

Much of the existing scholarly research into ASD has been focused on interventions, biology, and surveillance, with only a small fraction of funding and research going to lifespan and employment issues. The Interagency Autism Coordinating Committee with the United States Department of Health and Human Services reports that research focused on lifespan issues for individuals with ASD, which includes the transition to adulthood and employment, receives only 2 percent of total research funding (Office of Autism Research Coordination 2017). There is no comprehensive ecosystem review of the business issues that impact the employment of individuals with ASD. Despite the growing body of literature on disabilities and various employment issues

since the middle of the last century, relatively little is known specifically about employment for adults with ASD, particularly in a small business context.

Some thirty years after the implementation of the Americans with Disabilities Act (ADA), the workforce participation rate and employment rate of people with disabilities remains much lower than the general population. Youth with autism are among the least likely to be employed compared to peers with other disabilities. This is concerning as competitive employment is associated with positive outcomes and quality of life (Eggleton et al. 1999; García-Villamizar, Wehman, and Navarro 2002; Kober and Eggleton 2005). Other outcomes related to employment including independent living and social networks are less positive for people on the spectrum as well (Newman et al. 2011). However, there are also positive currents and opportunities not yet fully explored. One such opportunity is the small business sector. Ninety-nine percent of businesses in the United States are small businesses, employing nearly half of the private workforce (Office of Advocacy 2018).

The two core questions for this thesis then are “where are we now?” and “how did we get there?” in regards to competitive employment for individuals with autism spectrum disorder. Seeing the key role and importance of small businesses in the United States, particular focus will be applied to that sector. These questions will be answered through a multidisciplinary scoping review of the existing research on employment and autism within the macro-environmental scanning domains used in the field of strategic management: political, economic, social, and technological. The purpose is to gain an understanding of the forces shaping the competitive employment environment for people on the spectrum. The review yields a summary of threats and opportunities, provides

recommendations for increased and inclusive employment for people with autism, and identifies research gaps and future research opportunities.

It is of note that identity language is a widely and hotly debated topic in the autism community. Many self-advocates and allies prefer identity-first terminology like “autistic person” versus “individual with autism” because they view it impossible to separate a person from autism (Brown 2011). The American Medical Association Manual of Style prescribes writers to avoid labeling (and thus equating) people with their disabilities and recommends to put the person first (Young 2009). Withholding judgment in this debate, in this paper, I will use person-first language, unless it is a direct quote from a source or referring to a person with a known preference.

2. AUTISM SPECTRUM DISORDER

2.1 What is Autism?

Autism is not just the geeky kid without social skills. “If you've met one person with autism, you've met one person with autism” goes an often repeated quote in the autism community attributed to Dr. Stephen Shore (Lime Connect 2018). It perhaps succinctly describes why autism is labeled as a spectrum. Despite its use in vernacular and research alike, non-clinical labels such as high-functioning and low-functioning are commonly applied to indicate a person’s ability to adapt to a neurotypical environment, but they hold no official meaning or significance nor have a defined range. In fact, they may be harmful as an individual of above-average intellectual ability could be significantly impaired in social skills. In a 2015 TED talk, author Steve Silberman suggests that even if a PC is built with Windows in mind, if it is not running Windows does not mean that it is broken. In his view, autistic people similarly may have a hard time living in a world that is not built for them (Silberman 2015a).

An autism spectrum disorder diagnosis by itself does not mean there is an intellectual disability (ID) or physical disability. There are common comorbid diagnoses including ID. Although a spectrum can contain many extremes, there are standardized criteria to establish an ASD diagnosis. The most widely used criteria are from the American Psychiatric Association’s The Diagnostic and Statistical Manual of Mental Disorders (DSM). In 2013, the American Psychiatric Association published the fifth edition of The Diagnostic and Statistical Manual of Mental Disorders (DSM-5). Not without controversy, DSM-5 eliminated three separate diagnoses of autism, Asperger’s

disorder, and pervasive developmental disorder–not otherwise specified (PDD-NOS), and folded them into a single diagnostic entity called autism spectrum disorder.

At its core, an ASD diagnosis reflects persistent deficits in social communication and interaction across different contexts, as well as restricted and repetitive patterns of behavior (American Psychiatric Association 2013). Each of these two psychopathological domains have three levels of severity: level one meaning requiring support; level two meaning requiring substantial support; and level three meaning requiring very substantial support. It is noted that the severity may shift over time and vary by context (American Psychiatric Association 2013). Further criteria dictate that the symptoms must be demonstrated during early development and cause significant impairment in important areas of functioning (American Psychiatric Association 2013). And lastly, it is important these symptoms are not better explained by intellectual disability or global developmental delay (American Psychiatric Association 2013).

In practice, familiar observations include a failure to initiate or respond to social interactions, lack of eye contact or facial expressions, and a lack of interest in peers, as well as stimming, repetitive motor movements, intense focus and preoccupation, and unusual sensory sensitivity (American Psychiatric Association 2013). This can result in challenging behaviors including elopement, self-injury, compulsions, and meltdowns (Bell 2018). Although this answers the basic questions around the medical definition of autism, later in this work, the history of autism is further explored from a socio-cultural perspective. Evolving views on autism, disability, and neurodiversity provide an important context, particularly as it pertains to employment.

2.2 Epidemiology and Prevalence

In 2018, the Center for Disease Control and Prevention (CDC) published updated numbers on the prevalence of autism spectrum disorder. Estimates from the Autism and Developmental Disabilities Monitoring Network 2014 surveillance year now put the prevalence at one in fifty-nine children, a 15 percent increase from the 2012 surveillance year and a 151 percent increase from its first surveillance year in 2000 (Baio et al. 2018). Although the researchers warn this study cannot be generalized to the entire United States population, it has been the statistic most often referred to in research, the media, and by advocates and stakeholders.

Autism is currently mostly diagnosed with standardized assessment tools like the Autism Diagnostic Observation Schedule (ADOS) governed by the criteria in the DSM-5. Studies have shown that ASD is primarily a genetic condition (Bai et al. 2019; Tick et al. 2016), yet it does not have a clear or reliable biological marker to aid in a diagnosis. In addition, what may complicate research and prevalence surveillance is that there are differences between a medical diagnosis and an educational determination of disability. The medical diagnosis is typically done by developmental pediatricians, psychologists, or neurologists, aided by diagnostic manuals like ADOS. However, an educational determination is made by an evaluation team of various school professionals to determine whether a student qualifies for services under the Individuals with Disabilities Education Act (IDEA) (Wilkinson 2011).

In a multiple state study, Maddox et al. (2019) found that 90 percent of children receiving special education services for autism meet the criteria for autism on the ADOS.

However, they note significant state-by-state differences which could be explained by differences in how schools determine eligibility for autism services.

The rise in prevalence is often framed as either an issue of identification factors or an issue of increased risk among the population. The reality is that a more complex understanding is needed. Researchers have not found a singular defined cause for autism, and the cause of the increased prevalence has not been fully defined either, though most evidence points to diagnostic changes. Researchers looking at data from Denmark found that 60 percent of the increase in observed prevalence of ASD can be attributed to changes in reporting practices (Hansen, Schendel, and Parner 2015). A study in California found that more than a quarter of the increased autism caseload at the California Department of Developmental Services between 1992 and 2005 was associated with a diagnostic change—individuals previously diagnosed with mental retardation were now diagnosed with autism (King and Bearman 2009).

Recent findings suggest that there has been a broadening of the population with autism. As autism changed over the last fifty years from a narrowly defined categorical view toward a more inclusive heterogeneous spectrum-based view, differences between individuals with autism and the general population are decreasing and this could result in decreasing effect sizes of group comparison studies (Rødgaard et al. 2019). In the world of autism research, this may reduce the capacity to build useful models as lines between populations are blurred. It may be no stretch to apply this same perspective to efforts to standardize strategies for more inclusive employment. A population that is too broad will face challenges in targeting specific interventions.

2.3 Conditions Comorbid with Autism Spectrum Disorder

One of the challenges and difficulties in understanding autism and its place in the workforce is the wide range of the spectrum and the role that comorbid conditions may play. Distinguishing between ASD and other diagnoses may be challenging due to overlapping symptoms. In fact, according to the fourth edition text revision DSM (DSM-IV-TR), published in 2000, an individual could not be diagnosed with attention deficit hyperactivity disorder (ADHD) during the course of a pervasive developmental disorder (Matson and Williams 2013). This was later revised with the publishing of the DSM-5. Comorbid conditions may affect an individual's autistic symptoms (García-Villamizar and Rojahn 2015), or vice versa, an ASD diagnosis can impact how comorbid conditions are manifested or treated (Matson and William 2013).

Where in the past ASD was often a singular diagnosis, there has been an increased recognition of comorbid psychopathology in the last two decades. There has been a growing body of research and as a result a much better understanding of the interplay between autism and comorbid conditions. It is now commonly accepted that adults with ASD have a high prevalence of different psychiatric comorbidities (Vohra, Madhavan, and Sambamoorthi 2017). These differential and more accurate diagnoses of similar but distinct disorders are important to develop effective treatments, and in our case, important to understand when analyzing the employment environment. Outcomes for people with an autism-only diagnosis may look very different from outcomes for people with autism and epilepsy or people with autism and an intellectual disability.

Overlapping disorders and comorbidity may make it difficult to evaluate research that covers autism and employment issues. Although few studies imply causality, it may

be challenging to interpret outcomes for individuals with autism spectrum disorder when comorbid disorders may influence a correlation. As Cimera and Cowan (2009) find, placing the heterogeneous population with ASD into one category has limitations as individuals across the spectrum vary considerably. As echoed in Rødgaard et al. (2019), this makes it increasingly difficult to generalize between people with autism diagnoses. Schaller and Yang (2005) found that not having a secondary disability is significantly related to successful competitive employment services case closure. Holwerda, van der Klink, Groothoff, and Brouwer (2012), in a systematic review of predictors for work participation, found comorbidity negatively influencing work outcomes in five studies.

2.3.1 Common Comorbid Disorders

A large study, utilizing a three-state Medicaid database sample of adults examined comorbidity prevalence among adults with autism spectrum disorder. It found that 81 percent of adults with ASD had a psychiatric disorder comorbidity, compared to 42 percent of adults in a general population (Vohra, Madhavan, and Sambamoorthi 2017). Common comorbidities include: developmental disorders, anxiety, ADHD, and schizophrenia.

Table 1. Research on Common Comorbid Conditions with ASD.

Condition	Research findings Odds ratio of ASD and No ASD
Attention-deficit hyperactivity disorder (ADHD)	Adults with ASD: 8.2% Adults without ASD: 0.7% Adjusted Odds Ratio: 12.89 (Vohra, Madhavan, and Sambamoorthi 2017)

Table 1. Continued.

<p>Anxiety and mood disorders</p>	<p><i>Anxiety</i> Adults with ASD: 12.2% Adults without ASD: 5.6% Adjusted Odds Ratio 2.34 (Vohra, Madhavan, and Sambamoorthi 2017) No significant comorbidity found for mood disorders.</p> <p><i>Other source:</i> Compared with a sample of 1751 community children, children with Asperger syndrome and autistic children demonstrated a greater rate of anxiety and depression problems. (Kim et al. 2000)</p>
<p>Developmental disorders and intellectual disability</p>	<p><i>Developmental disorder</i> Adults with ASD: 69.5% Adults without ASD: 5.1% Adjusted Odds Ratio: 44.60 (Vohra, Madhavan, and Sambamoorthi 2017)</p> <p><i>Other source:</i> Rates of individuals with ASD and ID are about 50–70% of all ASD cases. (Matson and Shoemaker 2009)</p>
<p>Schizophrenia</p>	<p>Adults with ASD: 16.6% Adults without ASD: 11.1% Adjusted Odds Ratio: 1.61 (Vohra, Madhavan, and Sambamoorthi 2017)</p> <p><i>Other source:</i> Proportion in ASD population: 2.43% Proportion in general hospital population: 0.24% (Kohane et al. 2012)</p>

Table 1. Continued.

Epilepsy	Adults with ASD: 22.7% Adults without ASD: 4.8% Adjusted Odds Ratio: 5.84 (Vohra, Madhavan, and Sambamoorthi 2017) <i>Other sources:</i> Typically quoted at 30% but variable rates reported in the literature. (Maski, Jeste and Spence 2011) Proportion in ASD population: 19.44% Proportion in general hospital population: 2.19% (Kohane et al. 2012)
Sleep disorders	Sleep problems are common in ASD (reported in 40-86%) (Maski, Jeste and Spence 2011) Proportion in ASD: 1.12% Proportion in hospital: 0.14% (Kohane et al. 2012)
Sensory-processing disorder	Sensory symptoms are more frequent and prominent in children with autism than in typically developing children (Rogers and Ozonoff 2005)

2.4 Transition to Adulthood

As noted earlier, research focused on lifespan issues for individuals with ASD, which includes the transition to adulthood and employment, receives only 2 percent of total research funding. Employment and workforce issues start with this transition to adulthood.

The transition to adulthood for young adults on the autism spectrum is particularly harrowing. As students reach the end of their school career, the legal mandate for services changes drastically, colloquially called the “service cliff” (Roux 2015). In fact, services are already declining during a student’s high school tenure, particularly for those without

a comorbid ID diagnosis (Laxman et al. 2019). According to the data in the National Longitudinal Transition Study-2 (NLTS-2), only 19 percent of students with ASD had a vocational rehabilitation (VR) representative as an active member of the transition team (Shogren and Plotner 2012). More than two-thirds of families report that “some” or “great effort” was needed to access services following high school (Roux et al. 2015).

The findings from the NLTS-2 paint a bleak picture overall: compared to individuals with different disabilities, youth with autism are among the least likely to be employed or have held a job in the 8 years after high school graduation. Nearly 30 percent are not engaged in a productive activity of employment, post-secondary education, or job or skills training (Newman et al. 2011). Furthermore, compared to their peers with different disabilities, they are among the groups that work the fewest hours, are more likely to hold a temporary position, and are more likely to report an income of under \$25,000. In addition, individuals with ASD were least likely to have found a job on their own and more likely to have found a job through employment agencies or a teacher or school. Lastly, those individuals with ASD that were not employed were less likely to be looking (Newman et al. 2011)

Only 1 percent of individuals with ASD were married in the eight years after high school, they had the lowest rate of seeing friends at least weekly, and they are among the least likely to be living independently. According to the NLTS-2 study, about 42 percent of young adults on the autism spectrum never worked for pay during their early twenties (Newman et al. 2011). This leads to the purpose of this thesis of shaping better outcomes for people on the spectrum. To get to this purpose, a better understanding of the environment is needed.

3. ENVIRONMENTAL SCANNING

3.1 Strategic Management and Environmental Scanning

In the 1950s and 1960s, research institutions like Harvard Business School were leading the charge in developing strategic management concepts. Markets were no longer seen as operating under forces beyond the control of managers and firms, but rather as places where firms, with planning, could shape outcomes based on their responses to these forces (Ghemawat 2002). To be able to plan in, and adapt to, market environments, managers need theories and tools to analyze their current environments and situations. This analysis helps managers understand external and internal, and micro and macro, factors that impact strategy and influence business decisions. The goal of these analytical methods is to formulate a strategy for the firm to increase competitive advantage.

In the 1960s, Harvard scholar Francis J. Aguilar published his works on strategic management and how executives scan their firms' environment. The study is concerned with the way in which management gains relevant information, about events occurring outside the company, to guide the company's future course of action (Aguilar 1967). Echoing the contemporaneous concept of the strengths, weaknesses, opportunities, and threats (SWOT) analysis by Christensen, Andrews, and Bower, Aguilar posited that "strategy should be responsive to both the risks and opportunities confronting the company in its external environment and the strengths and weaknesses—present and potential—within the firm itself" (Aguilar 1967).

Aguilar's 1967 book *Scanning the Business Environment* is credited with introducing the taxonomy of this environmental scanning: economic, technical, political, and social. This was reshuffled by others into the acronym PEST. Subsequent authors and

researchers have added more factors to the taxonomy including legal, environmental, regulatory, ecological, demographic, and more. Some of these are superfluous and redundant.; legal and regulatory factors fit comfortably under the political umbrella. Others are not relevant to this research.

However, this thesis does not concern a particular firm, a singular industry, or even a market *an sich*, nor a firm's place within a market or environment. The perspective taken in this thesis is one of social change within the overall workforce, or an organizational change at an individual firm level. Still, for this purpose, Aguilar's PEST analysis may be best suited to answer the two central question of "where are we now?" and "how did we get there?" This question requires a comprehensive look at the environment in which the question is placed. In this thesis, the PEST framework examines the political, economic, social, and technological forces that impact this social change. The goal here is to identify the key environmental currents in which competitive employment for people with ASD is placed in order to formulate a strategy to increase this competitive employment and build a more neurodiverse workforce.

3.2 The PEST Analysis

Aguilar, in his book, ponders that the relevant world is too complex to be completely summarized in the environmental scanning activities (Aguilar 1967). He likens the process to piecing together a giant puzzle from the parts of many giant puzzles where you have to look for missing pieces while deciding which of the pieces even belong to your puzzle.

This is undoubtedly the dilemma in this analysis as well. Aguilar's framework provides a focus on the political, economic, social, and technological pieces of the

puzzle, but the history of autism and employment of people with disabilities touches many different laws, concepts, and directions. The subsequent section will provide a guide as to what specific pieces of the puzzle will be covered.

3.2.1 Political

The political and legal landscape in which employment of people on the spectrum is set touches on a wide variety of laws, policies, and issues. This thesis will explore the most impactful of these laws as well as a brief history of the legal and political environment. A considerable section will cover Title I of the Americans with Disabilities Act, which prohibits discrimination against individuals with disabilities in all aspects and stages of employment. Particular focus will be given to the impact of ADA on businesses as well as employees with relevant case law and regulations.

3.2.2 Economic

Employment is intertwined with the economy. The economic environment impacts business decisions on employment and hiring. Unemployment and workforce participation rates have implications for the economic situation of individuals with ASD. This thesis will focus the macro trends in the economy, the rate and modality of employment of people on the spectrum, and the small business environment.

3.2.3 Social

Trends in society impact the attitudes and perceptions towards people on the spectrum. This thesis will explore the social history of autism with a particular focus on public attitudes toward and awareness of autism and subsequently put this in the context of hiring and employment decision-making by managers.

3.2.4 Technological

The rate of technological change impacts employment on a global level.

Technology can increase production, shift employment requirements, and affect hiring and training. Special attention will be paid to adaptive and assistive technology that can lower barriers to employment, as well as technology shifts that can impact the jobs and skills required in the future of a neurodiverse workforce.

4. THE POLITICAL ENVIRONMENT

Employment and disabilities are intertwined in a complex maze of legislation with a long history and many different acts, amendments to acts, regulations, and court cases. What follows here is a brief history of disability rights and legislation and a look at some of the larger legal frameworks in which employment of people with ASD is placed.

4.1 A Brief History of Social Welfare Policy in the United States

Disability and poverty have been intertwined throughout political history. Nineteenth century England and its Poor Law Reform Bill of 1834 which discouraged relief to those refusing to enter a workhouse embodied the harsh and punitive attitude toward the poor (Trattner 1999). This was the era of Charles Dickens and the Victorian last-resort workhouses, where life should be made so miserable for the poor they would rather work than accept public aid. These poor laws spread westward and the idea that public relief tended to further impoverish and demoralize recipients had even more broader acceptance in the United States (Trattner 1999).

In the nineteenth century, social welfare in the United States. was a partnership where private philanthropy complemented public aid. A mixture of charity, government, and law that was not always congruent in philosophy. In the late 1800s, as the United States Congress chartered the Columbia Institution for the Instruction of the Deaf and Dumb and the Blind and state legislatures established other schools for the blind and deaf, some American municipalities enacted so-called “ugly laws” as a subset of beggar laws. In Chicago, in 1881, the city code mandated that any person who is “diseased, maimed, mutilated, or in any way deformed, so as to be an unsightly or disgusting object [...] shall not therein or thereon expose himself to public view” (Adrienne 2010) under

the penalty of a \$1 fine. A draft ordinance in New York added a reference to idiots and imbeciles so as to include cognitive disabilities (Schweik 2009).

Susan Schweik (2009) concludes that these ordinances epitomized the oppression of those with disabilities, embedded in classed social relations. In her book *Extraordinary Bodies*, Rosemarie Garland Thomson writes that “perhaps the most enduring form of segregation [for disabled people] has been economic: the history of begging is virtually synonymous with the history of disability” (Thomson, 1997).

In the 1930s, the Great Depression era, the United States followed the rest of the industrialized world into the welfare state. In 1938, the Fair Labor Standards Act (FLSA) created the right to a minimum wage and established the eight hour work day and forty hour work week and overtime pay for people who work over forty hours (Fair Labor Standards Act of 1938). The Act’s Section 14(c) is important for people with disabilities as it authorized employers to pay subminimum wages to workers who have disabilities. This provision prevails in law today and this will be covered further in subsequent sections.

Earlier, in 1935, the Social Security Act was enacted and signed into law by President Roosevelt. Today, the Social Security Administration has two main programs that provide cash benefits to people with disabilities: Social Security Disability Insurance (SSDI) and Supplemental Security Income (SSI). Not until some years after the passage of the initial Social Security Act, did Congress add public assistance programs under the SSDI program. The Social Security Amendments of 1956 established the first monthly cash benefits for persons who are disabled and aged fifty to sixty-four (Social Security Administration 2018b), with disability defined as blindness, or the “inability to engage in

any substantial gainful activity by reason of any medically determinable physical or mental impairment” (Social Security Amendments of 1956). The Social Security Amendments of 1960 established benefits for disabled workers under age fifty and the amendments of 1965 changed the definition of disability by changing the durational requirement from long-continued and indefinite duration to a continuous period of not less than 12 months (Kearney 2006).

In 1972, Congress established the SSI program for people sixty-five or older, or blind, or disabled, with payments beginning in 1974. Unlike SSDI, SSI benefits are not based on prior work. You can be eligible for both SSDI and SSI and people who receive SSI typically also receive Medicaid coverage and are eligible for the Supplemental Nutrition Assistance Program and housing vouchers (Social Security Administration 2018a).

4.2 Disability Rights: The Rehabilitation Act and Section 504

The 1960s was the culmination of many civil rights fights. The Civil Rights Act of 1964 included the equal employment opportunities of Title VII which prohibits discrimination on the basis of race, color, religion, sex, or national origin (Civil Rights Act of 1964). To further strengthen Title VII, the Equal Employment Opportunity Act of 1972 gave the Equal Employment Opportunity Commission (EEOC) the authority to initiate its own enforcement litigation and define discrimination (Equal Employment Opportunity Act of 1972). But disability was not yet a class.

However, with language that was adapted from the Civil Rights Act of 1964, in 1973, the Rehabilitation Act was signed into law. The act, in Sections 501 and 503, prohibits discrimination on the basis of disability and mandates the use of affirmative

action in employment and programs conducted by or receiving financial assistance from the federal government (Rehabilitation Act of 1973). Although the impact of the passing of the act was not immediately realized, Section 504 was the provision with the most profound consequences and effectively provided the first federal civil rights for people with disabilities (Fleischer and Zames 2011).

The Act and its definitions set precedents for subsequent legislation including the Americans with Disabilities Act in 1990. Section 504 of the Act states that “No otherwise qualified handicapped individual in the United States, [...] shall be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance” (Rehabilitation Act of 1973). The Act was amended in 1974 to broaden the definition of handicapped and defines individuals with disabilities as “Any person who (a) has a physical or mental impairment which substantially limits one or more of such person’s major life activities, (b) has a record of such an impairment, or (c) is regarded as having such an impairment” (Rehabilitation Act Amendments of 1974). Activists spent the next years fighting to issue regulations for Section 504 (Cone 2013).

In 2014, the act underwent significant regulatory expansion and established a nationwide 7 percent utilization goal for federal contractors to hire qualified individuals with disabilities, required contractors to invite applicants to self-identify pre- and post-offer stage and collect data, and implemented changes to the definition of disability to bring it in line with the ADA Amendments Act (ADAAA) of 2008, which will be covered shortly (Workforce Innovation and Opportunity Act).

4.3 The Americans with Disabilities Act: Title I

4.3.1 Introduction

Building on the 1973 Rehabilitation Act, in 1990, the Americans with Disabilities Act was signed into law by President George H.W. Bush. Title I of the act protects qualified individuals with disabilities from discrimination in the workplace. The Act covers the full spectrum of workplace issues from application to hiring, and placement to training, as well as advancement, discharge and retirement. There are two key parts to Title I: businesses are prohibited from excluding or otherwise denying equal jobs or benefits to a qualified individual; and businesses are required to make reasonable accommodations for the disability unless the accommodation poses an undue hardship for the business (ADA 1990).

Under the 1973 Supreme Court ruling in *McDonnell Douglas v. Green*, what became known as the McDonnell-Douglas burden-shifting framework, a plaintiff alleging disparate treatment must first establish a *prima facie* case of discrimination. This framework was subsequently used in ADA cases as well. The established *prima facie* elements to bring forth an ADA claim are (1) the plaintiff's employer is subject to the ADA; (2) the plaintiff is disabled within the meaning of the ADA; (3) the plaintiff is otherwise qualified to perform the essential functions of the job, with or without reasonable accommodation; and (4) the plaintiff suffered an adverse employment action because of a disability (*Jacques v. DiMarzio* 2004) A closer look into each of these elements will follow.

Before the amendments of 2008, a strict and narrow judicial interpretation of the ADA severely weakened the intended promise of providing “clear, strong, consistent,

enforceable standards addressing discrimination against individuals with disabilities” (ADA 1990). The ADA used the amended Rehabilitation Act of 1974 definition of disability, replacing the word handicapped with disabled (ADA 1990). Congress expected the definition would be interpreted under the ADA consistently with how it was applied under the Rehabilitation Act (29 C.F.R. § Pt. 1630). However, courts soon debated over the meaning of the phrases “substantially limits” and “major life activities.” In its first decade, the ADA turned out to be a windfall for defendants; from 1992 through 1998, defendant-employers prevailed against plaintiffs in 93 percent of cases (Colker 1999).

4.3.2 The ADA at the Supreme Court Before the 2008 Amendments

The outcomes of two specific Supreme Court cases significantly weakened and narrowed the scope of protection Congress intended with the ADA. In the first of these cases, *Sutton v. United Air Lines* in 1999, the Supreme Court found that corrective and mitigating measures should be considered in determining whether an individual is disabled under the ADA. The court found that a corrected impairment does not presently substantially limit a major life activity and the phrase “substantially limits” requires consideration of present, not future or hypothetical, impairment.

In Justice Stevens’ dissent in *Sutton v. United Air Lines*, he notes that the ADA should be given a generous rather than miserly construction (*Sutton v. United Air Lines* 1999). Justice Stevens suggests that the interpretation by the court’s majority allows an employer to refuse to hire any person whose disability is controlled by medication or even individuals who functions efficiently with a prosthetic limb (*Sutton v. United Air Lines* 1999). In other words, the ADA’s safeguards vanish when individuals seemingly overcome their limitations.

In 2002, in *Toyota Motor Manufacturing, Kentucky, Inc. v. Williams*, the Supreme Court strictly interpreted the meaning of substantially limiting a major life activity as an impairment that “prevents or severely restricts the individual from doing activities that are of central importance to most people's daily lives.” Justice O’Connor, delivering the opinion of the court clarifies that this determination is not limited to activities in the workplace alone, but to manual tasks in life in general (*Toyota v. Williams* 2002). In other words, because Williams was able to do personal tasks and household chores, a strict reading of the ADA would not find Williams disabled under the statutes of the ADA.

These issues are of particular interest to people with an ASD diagnosis that have learned to control certain challenges or autistic traits. In addition, if these traits pose challenges in the workplace but do not substantially limit daily life, people with autism would not be found disabled under the ADA.

4.3.3 *The ADA Amendments of 2008*

Both *Sutton* and *Toyota Motor Manufacturing* cases spurred Congress to intervene in 2008 to restore the initial vision of the ADA with the passage of the ADA Amendments Act. Echoing Justice Stevens’ dissent, Congress made clear to courts that the determination of disability should not require extensive analysis and should favor of broad coverage (ADAAA 2008).

Countering *Toyota Motor Manufacturing*, an impairment no longer needed to “prevent, or significantly or severely restrict, the individual from performing a major life activity in order to be considered substantially limiting” (29 C.F.R. § 1630.2). The amendments also listed more activities that constitute major life activities, including brain functions such as concentrating, thinking, and communicating (ADAAA 2008).

Specifically countering *Sutton*, the amendments specified that the determination of substantially limiting a major life activity is not dependent on mitigating measures, including, importantly for people with autism spectrum disorder, learned behavioral or adaptive neurological modifications and the use of assistive technology (ADAAA 2008).

4.3.4 *Qualifications and Essential Job Functions*

Before the 2008 amendments, people with ASD had a hard time proving they were disabled under the statutes of the ADA. In *Jacques v. DiMarzio*, the court held that the standard of “substantially limited” is not satisfied by a plaintiff who has a basic ability to communicate with others but whose communication is inappropriate, ineffective, or unsuccessful (2004). In *Comber v. Prologue*, the court made no judgment on whether social interaction was a major life activity. However, the court found that although Comber submitted evidence to show that her autism directly affected her ability to form social relationships (having provided expert testimony that she lives in social isolation), she was able to work successfully for years and the court subsequently characterized the issue as a mere personality conflict not sufficient to establish a disability (*Comber v. Prologue* 2000).

The Equal Employment Opportunity Commission added “interacting with others” to its regulatory list as a major life activity after the 2008 amendments (held by the court in *Jacobs v. N.C. Admin. Office of the Courts* in 2015) and stated that ASD is “virtually always be found to impose a substantial limitation” because it “substantially limits brain function” (29 C.F.R. § 1630.2). Although employee-plaintiffs have found greater success post-amendments (Hensel 2017), some courts still find an autism diagnosis lacking the substantially limited qualification. In 2013, in *Morse v. Midwest Indep. Transmission Sys.*

Operator, Inc., the court found no evidence that the plaintiff was substantially limited in any major life activity due to his Asperger's diagnosis, aided by the plaintiff's own testimony that he did not regard his condition as severe (*Morse v. Midwest* 2013). This perhaps shows that labels such as high-functioning may not be helpful. A general ability to pursue daily life activities may conceal specific challenges of autism as a condition.

Even with more successes in getting courts to establish the existence of a protected disability, an applicant or employee must still demonstrate his or her qualification for the job. This is measured by whether the person has the appropriate education background, skills, and experience. If so, the person must be able to perform "essential job functions" with or without reasonable accommodation provided by the employer (Mika and Wimbiscus 1996).

For those plaintiffs with ASD who established a disability, many of the same courts that previously rejected interacting with others as a major life activity concluded that "getting along with others" was an essential function of nearly every job (Hensel, 2017). Plaintiffs with ASD and other mental disabilities have more trouble being deemed otherwise qualified to perform essential functions of the job than plaintiffs with physical disabilities (Hensel and Jones 2005).

The United States Court of Appeals, Eleventh Circuit in *Taylor v. Food World, Inc.* in 1998 found that "interacting appropriately with customers" is also an essential job function, raising the question whether Taylor was otherwise qualified. An earlier district court ruled that as a matter of law, Taylor's on-the-job behavior (speaking loudly and asking customers personal questions) disqualified him for the position of utility clerk. The Eleventh Circuit found that issues of material fact remained as to whether Taylor was

qualified. The same court cited *Taylor* in a subsequent court decision in 2003 in *Ray v. Kroger Co.* in which a man with Tourette's Syndrome was deemed unable to perform the essential job function of interacting with customers without offending them.

Although some courts have held that the employer must tolerate “eccentric or unusual conduct” due to a disability (*Den Hartog v. Wasatch Acad.* 1997), the more recent majority view is that an employer can discipline or terminate an employee for workplace misconduct even when the misconduct is a result of the disability (*Caporicci v. Chipotle* 2018). However, ADA cases are often considered on the merits of an individualized assessment. In *Huge v. Boeing Co.* in 2015, the court was convinced that a reasonable fact-finder could view the plaintiff’s disruptive behavior as conduct resulting from a disability.

The term qualified is framed within essential job functions, not marginal functions. However, the ADA requires consideration of the employer's judgment as to what functions of a job are essential and formal job descriptions are considered evidence of the essential functions (42 U.S.C.A. § 12111). Courts have generally given substantial weight to the employer's view of job requirements (*Ward v. Massachusetts Health Research Inst.* 2000). In *Kinghorn v. Gen. Hosp. Corp* in 2014, the court considered working independently on projects with limited supervision, strong communication skills, and working collaboratively—all generally skills that may be difficult for people with autism spectrum disorder—essential job functions.

Courts have found other implicit essential functions to include: being amenable to supervision and the ability to follow orders of supervisors; ability to control behavior and refrain from physical violence; understand ordinary pressures of the job; as well as

regular and predictable attendance (*E.E.O.C. v. Ford Motor* 2015; Mika and Wimbiscus 1996).

4.3.5 Reasonable Accommodation and Undue Hardship

There are two more key concepts of the ADA: reasonable accommodation and undue hardship. An employer is required to provide a reasonable accommodation so that a person who is disabled can fulfill the essential job functions. This may include making existing facilities readily accessible or less tangible solutions like job restructuring, modifying work schedules, utilizing equipment or devices, and providing training (42 U.S.C.A. § 12111). This can be an informal, interactive process with the employee (Mika and Wimbiscus 1996).

Courts have warned, however, that the goal is to identify and provide an accommodation that allows the employee to perform the defined job effectively, not to provide the job of the employee's choice (*Connolly v. Entex Info* 2001). In addition, a reasonable accommodation cannot involve the elimination of an essential job function (*Shannon v. New York City Transit Auth.* 2003).

Accommodations for employees with ASD may address social skill deficits by appointing a coach or mentor, using logical language and concrete examples over emotional language and abstract concepts when training, and encouraging digital communications over personal communications. In addition, making changes in the physical environment may address sensory overstimulation (Hensel 2017). Work-at-home arrangements are increasingly an option and courts have found instances where these arrangements, if the essential functions of the position can be performed at home, would not cause an undue hardship (*Humphrey v. Mem'l Hosps. Ass'n* 2001).

The term “undue hardship” means an action requiring significant difficulty or expense. Factors to determine what may be an undue hardship include the nature and net cost of the accommodation, the overall financial resources available, and the impact of the accommodation on the operation (42 U.S.C.A. § 12111). The law is unclear on what exactly a reasonable accommodation is or how a business can define or calculate undue hardship because no single definition can adequately account for all business situations and for all disabilities. This creates difficulties applying the ADA in a systematic manner (Hollwitz and Goodman 1995). The Hollwitz and Goodman study proposes a system whereby an organization can make consistent decisions about reasonableness and hardship. Although this paper outlines a reasonable model for physical disabilities and accommodations, it may be more difficult to calculate accommodations for neurological or mental disabilities.

4.3.6 The ADA and Employment Rates, ASD, and Business Size

The stated purpose of the ADA was to eliminate discrimination against individuals with disabilities. However, some studies have found adverse effects of the ADA on employment rates and wages. DeLeire (2000) found that in the years following passage, from 1990 to 1995, employment rates of men with disabilities fell 7.2 percent compared to men without disabilities. In addition, wages of disabled men did not change after passage of the ADA.

A more recent study by Kim and Rhee (2018) measuring the effects of the employment protection policies found that the introduction of the ADA decreased the employment to non-employment transition rate by up to 4.3 percent. The ADA seemingly increased protection of current employees. The model created in this study illustrates that

the policy induces firms to retain workers due to increased costs of firing. But it also creates the effect that firms face higher costs when creating a new job, which results in a negative impact on job-finding rates and an ambiguous overall net effect on employment rates of disabled workers (Kim and Rhee 2018).

There is no definitive research on the effects of the ADA on employment rates and caution should be exercised before jumping to any conclusions. There may be other plausible reasons for the initial decline in employment rates, including a correlation to the growth of disability programs in the 1990s (Foreman and Jefferson 2000).

In a 2008 study on workplace discrimination and autism spectrum disorders, researchers found that allegations from people with ASD only make up 0.03 percent of the total number of cases (Van Wieren, Reid, and McMahon 2008). This may mean that workplace discrimination is not a significant problem for individuals with ASD, or that they are especially at risk for not advocating for themselves compared to other disability groups (Van Wieren, Reid, and McMahon 2008).

It is important to note that the Americans with Disabilities Act, as well as other federal employment anti-discrimination laws as enforced by the Equal Employment Opportunity Commission, apply to businesses with fifteen or more employees. This effectively excludes the millions of microbusinesses operating in the United States. Using data from the EEOC, a study by Von Schrader and Nazarov (2015) examined the employer characteristics associated with discrimination charges under the ADA. The research finds that establishment size—with a minimum size of fifty—is negatively correlated with discrimination charge rate. The authors suggest outreach efforts may want

to target smaller employers who may have fewer formal structures in place and are most at risk of receiving charges (Von Schrader and Nazarov 2015).

The Van Wieren study also found that cases brought by people with ASD were to be found in either the fifteen to one hundred employee company size (37.1%) or 501 and over employee company size (38.2%). However, the odds of an ASD allegation being resolved with discrimination determined by the EEOC to have occurred increases with larger firm sizes. The larger the firm, the more likely a case was found to have merit (Van Wieren, Reid, and McMahon 2008).

4.4 Other relevant legislation

4.4.1 Javits-Wagner-O'Day Act (JWOD)

In 1938, President Franklin D. Roosevelt signed the Wagner-O'Day Act and Congress established the Committee on Purchases of Blind-Made Products. The aim of the program was to create employment opportunities through the use of the Federal procurement system. The Committee designated a newly incorporated nonprofit the National Industries for the Blind to administer the program.

More than 30 years later, in 1971, the legislation was amended and renamed the Javits-Wagner-O'Day Act to include people with significant disabilities. In this context, severely handicapped means unable to engage in normal competitive employment over an extended period of time. Shortly thereafter, the National Industries for the Severely Handicapped was established in 1974. It was later renamed SourceAmerica in 2013. The Javits-Wagner-O'Day Act was rebranded in 2006 to the AbilityOne program and it currently employs approximately 45,000 people who are blind or have significant disabilities in more than 1,000 locations (U.S. AbilityOne Commission n.d.). In 2015,

seven major advocacy organizations including the National Federation for the Blind and the Autistic Self Advocacy Network (ASAN) released a joint press release calling for reform of the AbilityOne program. Among other things, it called for a commitment to the integration mandate rather than operate separated work environments, the elimination Section 14(c) subminimum wage payments, and more competition in awarding contracts by including disability-owned businesses and self-employed individuals with disabilities (National Federation for the Blind 2015). In a declaration dated March 2016, the United States AbilityOne Commission states that more than ninety percent of program employees earn at least the Federal minimum wage and it further commits to advocate for this standard to be met across the AbilityOne Program (U.S. AbilityOne Commission 2016).

4.4.2 Individuals with Disabilities Education Act of 1975 and 1990 (IDEA)

Today, the public school system plays an important role in providing services and supports for children with disabilities, and increasingly this role includes preparing students for better post-secondary education outcomes and the transition to adulthood. But this role for the public school system didn't emerge until the emergence of disability rights. In 1972, in *Mills vs. Board of Education*, the District Court, ruled that "no child eligible for a publicly supported education in the District of Columbia public schools shall be excluded from a regular public school assignment." In effect, students with disabilities, regardless of severity, must be given a public education.

The aforementioned Section 504 of the 1973 Rehabilitation Act is also enforced by the United States Department of Education. Recipients of federal funds include public school districts, institutions of higher education, and other state and local education

agencies. The department's regulations state that schools "must afford handicapped persons equal opportunity [...] in the most integrated setting appropriate to the person's needs" (34 C.F.R. Part 104).

To address the public school system more fully, in 1975, Congress enacted the Education for All Handicapped Children Act (EAHC). Before passage, one million out of eight million children with disabilities were excluded entirely from the public school system. The act was enacted to guarantee a free appropriate public education designed to meet a student's unique needs and assist state and local governments to provide for the education of all children with disabilities (Education for All Handicapped Children Act of 1975). However, the 1975 EAHC merely mentions employment once and does not cover the transition to adulthood. The Act was amended in 1990 and renamed the Individuals with Disabilities Education Act (IDEA). These amendments expanded the role of schools in preparing students for further education, employment, and independent living, and aimed to ensure equality of opportunity, full participation, and economic self-sufficiency for individuals with disabilities (IDEA 1990).

Congress realized transition services and the promotion of successful post-secondary education or employment opportunities were an important measure of accountability (IDEA 1990). With IDEA, providing transition services came to the forefront in a student's individualized education program (IEP). The IEP is a written statement that includes a student's present levels and progress toward an appropriate measurable postsecondary goal and age appropriate transition assessments related to training, education, employment, and independent living skills (IDEA 1990). Transition

services can be incorporated when the IEP team deems it necessary, but it is mandated by age sixteen and must include the student attendance at IEP meetings.

4.4.2.1 The Role of School in Providing Services

With the role of the public school system in providing services and support cemented in legislation, the question arises how this looks for families with kids on the autism spectrum and how these supports are included in students' IEPs. With the emphasis on individualizing services, Wei et al. (2014) found the pattern of services across a child's school career changes from pre-kindergarten through high school with the number of services received decreasing as children enter new stages.

In looking at services and supports for secondary school students with disabilities, Levine, Marder and Wagner (2007) found particularly troubling picture for students with autism and their parents. With an increasing prevalence, schools may not be as well prepared to deal with the challenges of autism. Compared to other disabilities, the greatest number of parents (32.5 percent) reported "a great deal of effort" to obtain services. Parents of students with autism were also least likely to report services are sufficient and were most likely to be on a waiting list for services. Still it seems autism outpaces services demands compared to other disabilities with 90 percent of parents reporting receiving services from school, compared to a 72 percent average for all disabilities (Levine, Marder, and Wagner 2007).

In addition, information for services and help are disproportionately found outside the school for parents of kids with autism, perhaps further highlighting the general unpreparedness of schools to meet the needs of families with ASD. These families were least likely to learn about services from school and most likely to learn from friends,

family, and media sources, compared to other disabilities. However, a larger share of students with autism received vocational services through school (Levine, Marder, and Wagner 2007).

4.4.3 Workforce Investment Act (WIA) of 1998 and Workforce Innovation and Opportunity Act (WIOA) of 2014

Signed as part of the New Deal, the Wagner-Peyser Act of 1933 established the Employment Service (ES), a national system of public employment service offices. The Workforce Investment Act of 1998 sought to improve employment, training, and vocational rehabilitation programs (WIA 1998) and it was repealed and replaced by the 2014 Workforce Innovation and Opportunity Act to increase coordination among federal workforce development programs (WIOA 2014).

The WIA and WIOA amended the Wagner-Peyser Act by making ES part of so-called one-stop career centers through which state and local employment and training activities are provided with certain required partners. At the one-stop career center, an individual can receive multiple services and find all the information needed in one place (Gilson 2000). Each workforce investment area in a state (the number varies by state) is required to have at least one comprehensive one-stop center with partners including ES, Vocational Rehabilitation State Grant Programs, and Adult Employment and Training Activities (Bradley 2015).

It is important to note that these one-step centers are not specifically geared towards individuals with disabilities. It was generally hoped that people with disabilities would be able to use the same information resources and services as nondisabled job seekers, but as Gilson (2000) notes, the ability to serve people with disabilities at one-

stop centers depends on the extent to which the appropriate agencies and organizations participate as partners.

Another key part of the WIOA was the establishment of the Advisory Committee on Increasing Competitive Integrated Employment for Individuals with Disabilities. The committee submitted a final report summarizing findings and recommendations on ways to increase competitive employment opportunities for people who are disabled, as well as on the use and oversight of the Section 14(c) certificate program (Advisory Committee on Increasing Competitive Integrated Employment 2016). This committee included Ari Ne'eman, president of ASAN.

Among the committee's recommendations emerged a theme of capacity building: prioritizing federal funding for competitive integrated employment; transition youth to adult employment with early work experiences, family support, professional development and training, systems integration, and assistive technology; phasing out Section 14(c) certificates; and reforming the AbilityOne program towards competitive employment as well as the criteria for contract procurement selection in the Javits-Wagner-O'Day Act (Advisory Committee on Increasing Competitive Integrated Employment 2016).

4.4.4 Ticket to Work and Work Incentives Improvement Act (TWWIIA) of 1999

The Ticket to Work and Work Incentives Improvement Act of 1999 was signed into law to expand health care coverage for working individuals with disabilities (TWWIIA 1999). The Act amends the Social Security Act to support career development of Social Security disability beneficiaries (SSDI and SSI) that are working age eighteen through sixty-four and who wish to return to work. One of the greatest barriers keeping individuals with disabilities from maximizing employment and earning potential is the

fear of losing health care. The loss of cash benefits, and of Medicare or Medicaid coverage linked to it, may be greater than the gain in employment and earning (TWWIIA 1999). The purpose of the Act is to provide health care continuation and employment preparation and, by maximizing employment, reduce the dependency on cash benefit programs (TWWIIA 1999).

Participants will receive full Social Security benefits during a trial work period of nine months. After this trial period, beneficiaries have thirty-six months in which they can still receive benefits if earnings are not substantial (\$1,220 per month in 2019). Medicare Part A coverage will continue for at least ninety-three months after the trial period (Social Security Administration 2019).

From its implementation in 2002 through 2008, initial enrollment growth was slow. In fact, the program was in decline from 2004 through 2007 in both provider interest and program participants. There is limited research in program utilization. Hernandez (2007) reports that accurate knowledge and utilization was limited and fear of losing existing medical and cash benefits remained. Both provider and beneficiary participation saw accelerated growth after the program underwent a major regulatory overhaul in 2008. However, this did not result in more participants reducing dependency on cash benefit programs (Schimmel, Hyde, and Stapleton 2015).

4.5 Recent Legal Environment

In recent years, there have been a few autism legislative proposals that have died in committee or have not mustered enough support. The Expanding the Promise for Individuals with Autism Act of 2007 introduced by Representative Michael F. Doyle and Senator Hillary Rodham Clinton covered mostly behavioral treatments, interventions, and

services for children and families, but also included planning and demonstration grants of \$20 million for each year from 2008 to 2012 for States to provide services for adults with autism to enable them to be as independent as possible. Neither House bill or Senate bill made it out of committee.

The Disability Employment Incentive Act of 2018, introduced by Senator Robert P. Casey, would expand tax incentives to businesses who hire individuals with disabilities by amending the Internal Revenue Code of 1986 work opportunity credit and enhance small business deductions for expenditures. This bill did not make it out of the Senate Finance Committee.

Currently in the Senate Committee on Health, Education, Labor, and Pensions is the Transformation to Competitive Employment Act of 2019, introduced by Senator Robert P. Casey. This bill would assist employers transition from providing employment under the special Section 14(c) certificates to providing competitive, integrated employment by funding state grant programs. It would also sunset and phase out the special certificates altogether by prohibiting the issuing of new certificates. A similar bill phasing out special certificates, but without assistance for employers, named Transitioning to Integrated and Meaningful Employment Act died in committee in 2015.

Lastly, the Autism CARES Act of 2019 was recently signed into law. This bill is a reauthorization of the 2014 bill which itself was a reauthorization of existing spending on research, surveillance, intervention, early detection, and education activities related to ASD. One of the outcomes from this bill was a report to Congress on young adults and transitioning youth published in 2017.

5. THE ECONOMIC ENVIRONMENT

Most studies evaluating the economic factors of autism look at cost with a focus on medical services provided to children with ASD. Few studies look at costs beyond childhood, non-medical direct costs and indirect costs, opportunity costs, and even fewer explore a cost-benefit balance, particularly on the employment of people with ASD. In this chapter, the economic environment is approached from three perspectives: societal, employers hiring people with ASD, and the individual with ASD. These three perspectives cover issues including unemployment rate, labor force participation, the state of the economy and disability benefits therein, as well as the modality of employment.

5.1 Societal Costs of Autism

The increasing rate of prevalence means there is an increasing need for behavioral, educational, and occupational services. In addition, there will be a rising number of youth with ASD transitioning to adulthood who will face an adverse employment environment. The economic impact of autism spectrum disorder on families and society touches many areas and can vary greatly due to differences in costs of treatment, care, and support along the spectrum. The presence of comorbid conditions like intellectual disability can greatly affect these costs as well (Buescher et al. 2014).

It is difficult to compute the lifetime and societal costs of autism. The multitude of direct and indirect factors and costs, the wide range of the spectrum, comorbidities and services required, and the growing prevalence, make this calculation a complex estimate. There currently exist two main studies looking at costs in the United States with widely varying results. The latest cost estimates from Buescher et al. (2014) looked at the

aggregate costs of autism spectrum disorder by reviewing existing literature of cost estimates by specific areas like accommodation, medical and nonmedical services, special education, employment support, and productivity loss. The lifetime cost of supporting an individual with ASD and an intellectual disability was \$2.4 million in the United States. The lifetime cost of supporting an individual with ASD without an intellectual disability was \$1.4 million. With an estimated 3.5 million individuals with ASD, and assuming a 40:60 split between ID and no ID, total annual cost was estimated to be \$236 billion in 2014, with \$175 billion (or 74 percent) of the cost coming from adults. Buescher et al. found that seventy-nine percent of the total cost was accounted for by services and 12 percent by productivity costs.

A 2007 study by Ganz looked at a hypothetical ASD cohort diagnosed in 2003 and found a significantly higher per capita life incremental societal cost of \$3.2 million. Incremental here means additional costs that are exclusively due to autism. This study has a more in-depth look at how costs are distributed and how cost categories vary over the lifespan. The total cost for the 2003 diagnosis cohort is estimated at \$35 billion. With 59 percent of the total cost, Ganz finds lost productivity, or indirect costs, as the largest components of costs. See Table 2 for a selected comparison between Buescher et al. and Ganz.

These societal costs impact a broad audience across society including families, insurers, and government. A more recent study estimates that by 2025, using the same criteria as Buescher et al. (2014), the cost will rise to \$461 billion, or 1.649 percent of GDP. Applying different criteria, one scenario with an assumed continued increase in prevalence numbers even tops \$1 trillion in 2025, representing 3.6 percent of GDP (Leigh

and Juan 2015). No study to date has looked at who bears the brunt of these costs: families, health care systems, or government. In September 2016, a Kaiser Permanente Center for Health Research investigator was awarded \$2.7 million for a four-year study with 1,500 families to assess the impact on families (Pope 2016).

Table 2. Selected Comparison Between Buescher et al. and Ganz Cost Studies.

	Buescher et al. (Ages 0-67)	Ganz (Ages 3-66)
Special education (Includes early intervention services for Buescher et al.)	Annual: \$62,920 (0-5, with ID) \$27,961 (6-21, with ID) \$31,460 (0-5, without ID) \$13,980 (6-21, without ID) Total: \$761,976 (with ID) \$380,980 (without ID)	Annual: \$4,586 (3-7) \$10,343 (8-12) \$8,922 (13-17) \$6,247 (18-22) Total: \$150,483 Total behavioral therapies (3-22): \$206,337 Total: \$356,820
Employment support or supported work	Annual: \$705 (with ID) \$352 (without ID) Total (assuming 18-67): \$35,955 (with ID) \$17,952 (without ID)	Annual: Ranges \$291 (53-57) to \$836 (23-27) Average \$387 (18-66) Total: \$19,349
Productivity loss (parents)	Annual: \$18,720 (0-17, both with and without ID) \$1,896 (18-67) Total: \$433,656	Annual: Ranges \$43,066 (3-7) to \$3,136 (28-32) Total: \$904,595 (3-32)
Productivity loss (self)	Annual: \$10,718 (18-67, both with and without ID) Total: \$546,618	Annual: Ranges \$32,704 (23-27) to \$17,776 (53-57) Total: \$971,072 (23-57)

5.2 Labor Force Participation and Unemployment

As seen above, productivity loss is a major factor in the societal costs of autism. It is difficult to get accurate numbers of labor force participation, unemployment rates, and underemployment for people with autism spectrum disorder. Limited, small sample research has demonstrated poor employment rates, but with numbers widely varying depending on the characteristics of the study sample. Hendricks (2010), taking into account various studies, estimates the unemployment rate at 50 percent to 75 percent. Being a heterogeneous population, the severity of the condition impacts employment outcomes. Ohl et al. (2017), in a study of 254 individuals with an Asperger's diagnosis, which is considered to be a less severe form of ASD, found an unemployment rate of just over 38 percent.

Young adults seem to fare worse. Roux et al. (2015) found that nearly 42 percent of young adults with ASD never worked for pay between high school and their early 20s, a much higher rate than their peers with other disabilities. Taylor and Seltzer (2011), followed a subset of a larger longitudinal study of young adults and found that only 6 percent of participants had competitive jobs, 12 percent were in supported employment, and none worked full-time.

The Bureau of Labor Statistics only looks at disability as a whole and does not report on specific disabilities or categories of disabilities. The unemployment rate for people with disabilities is nearly twice the unemployment rate of the non-disabled population. As the economy has picked up since the Great Depression, individuals without disabilities seemed to have fared better. In a snapshot from 2009 through 2018,

the unemployment rate for people without disability decreased 59 percent while the unemployment rate for people with disabilities decreased by 45 percent.

An even starker difference is found when looking at the labor force participation rate. Nearly 80 percent of people with disabilities are not in the labor force, whereas nearly 32 percent of non-disabled people are not in the labor force. Although this in part reflects the older age profile of persons with a disability, in the sixteen to sixty-four age group the difference is even more pronounced with 67 percent of people with disabilities not in the labor force compared to 23 percent of non-disabled people. In addition, 31 percent of workers with a disability were employed part-time, compared to 17 percent of workers with no disability in 2018 (Bureau of Labor Statistics 2019).

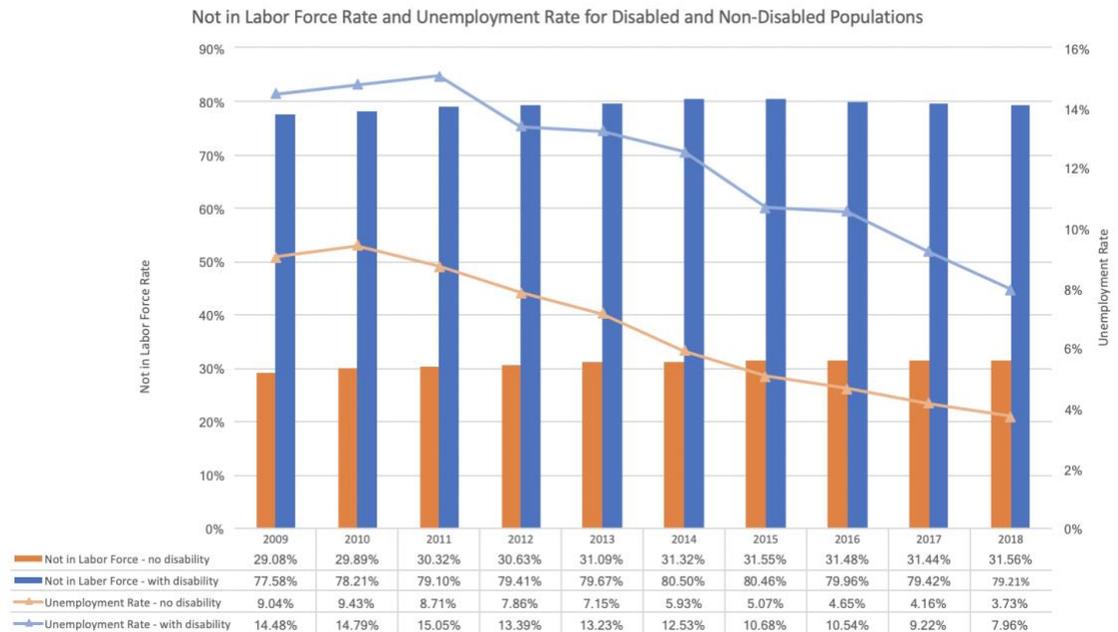


Figure 1. Not in Labor Force Rate and Unemployment Rate for U.S. Population.

Those individuals with ASD who are employed are often underemployed. The National Autism Indicators Report, gleaned data from the NLTS-2, states that of those young adults on the autism spectrum who did work, nearly 80 percent worked part-time

and earned an average of \$9.11 per hour (Roux et al. 2015). Taylor and Seltzer (2011) report that employment typically involves only menial tasks. Post-school employment outcomes for young adults with severe disabilities involve low wages and minimal hours, with most experiences occurring in segregated or sheltered settings (Carter, Austin, and Trainor 2012).

5.3 Modality of Employment

5.3.1 Sheltered Workshops and Segregated Employment

Sheltered workshops, also known as community workshops or the more recent term work centers, first emerged in the United States as offshoots of the nineteenth century schools for the blind (tenBroek 1960). These workshops or centers provide segregated—meaning not integrated with a regular workforce—vocational programs. The programs can differ widely in mission, services provided, and funding sources. Most are operated through private, nonprofit organizations (Kregel and Dean 2002).

Many of these workshops operate under Section 14(c) of the Fair Labor Standards Act of 1938, which authorizes employers to pay subminimum wages to workers who have disabilities. Authorization is granted through a certificate from the Wage and Hour Division of the United States Department of Labor. However, in more recent years, United States public policy has gradually moved away from sheltered workshops in favor of integrated employment.

In 1999, the United States Supreme Court held in *Olmstead v. L.C.* that unjustified segregation of persons with disabilities constitutes discrimination in violation of Title II of the Americans with Disabilities Act. In 2001, the United States Department of Education amended the definition of employment outcome in regulations governing

the State Vocational Rehabilitation Services Program. In the decades before *Olmstead*, placement in sheltered workshops was considered an appropriate employment outcome for people with disabilities. But with a new court mandate and Department of Education definition, employment outcomes are now defined as full or part-time employment integrated in the regular labor market. This includes supported employment, self-employment, remote employment, or business ownership (Kregel and Dean 2002).

A 2015 National Public Radio (NPR) report states there are still about 300,000 people working in sheltered workshops nationwide and states are phasing out the programs in lieu of integrated employment, but there is disagreement within the community about whether that is a good idea (Sommerstein 2015). Perhaps the best known example, Goodwill Industries International, has historically operated many sheltered workshops. In the last five years, the company has transitioned away from workshops and its workers will be paid minimum wage (Giammarise 2017).

Cimera et al. (2012) found that individuals who participated in sheltered workshops and subsequently were placed in competitive settings earned significantly less and cost significantly more to serve in VR services than their peers in competitive settings that did not start in sheltered workshops. The authors caution that this may be due to individuals first placed in sheltered workshops having more severe impairments. However, it does call into question the popular narrative of sheltered workshops serving as a stepping stone towards integrated employment. For adults with ASD and other developmental disabilities, segregated facility-based programs continue to be the primary model of service delivery, particularly for those with more severe impairments (Cimera et al. 2012; Carter, Austin, and Trainor 2012).

5.3.2 *Competitive Employment: Vocational Rehabilitation and Supported Employment*

Broader emphasis on supported employment emerged in the 1970s with the passage of the Rehabilitation Act and Education for All Handicapped Children Act, as well as the Supreme Court's *Olmstead* decision. Supported employment soon displaced sheltered workshops and segregated employment as the preferred outcome. Supported employment means competitive employment integrated in an open labor market with ongoing support services. Placement and support services are often organized by state-run, federally-funded vocational rehabilitation programs. Generally, people with disabilities are entitled to receive free services including job training and placement from these state programs. The number of individuals with autism in the vocational rehabilitation system has increased substantially over the years. Cimera et al. (2009) report an increase of more than 121 percent from 2002 to 2006 in adults. Burgess and Cimera (2014) report an increase of 265 percent from 2002 to 2011 in transitioning youth (19-25), representing 0.86 percent of the total vocational rehabilitation population in 2002 and 5.43 percent in 2011.

Although adults with autism are perhaps employed at higher rates than most disability groups after the closing of VR cases, they tend to work far fewer hours and earn less in wages per week (Cimera et al. 2009; Burgess and Cimera 2014). Adults with autism are also among the most costly groups in VR services. This may be due to the pervasiveness of the condition, and individuals on the spectrum simply requiring more services. Alternatively, because people with ASD are still a very small proportion of the overall VR consumer population, the infrequent exposure creates unfamiliarity for VR counselors (Cimera et al. 2009). This is echoed in Robert D. Austin's (2018) case study

of the supported employment program at Hart Schaffner Marx (HSM), where among the issues identified was the variability in format and quality of assistance by local social service organizations and a lack of experience with people with ASD.

Burgess and Cimera (2011) found that individuals with autism who were working in the community after closing their VR cases generated more monetary benefits than costs. For every dollar participants relinquished in benefits as a result of working, they generated \$5.28 in wages earned.

5.4 Disability Benefits and the State of the Economy

The Social Security Administration reports more than ten million people were receiving Social Security disability insurance benefits and more than eight million individuals received monthly supplemental security income in 2017. Federal expenditures for cash payments were \$142.7 billion and \$54.6 billion respectively. Expressed as a percentage of the Gross Domestic Product (GDP), combined these expenditures were just over 1 percent in 2017 (Social Security Administration 2018a; Social Security Administration 2018b).

Workers with autism make up only 0.3 percent of total workers receiving SSDI benefits and look different from the average SSDI recipient: although the average recipient age is just over fifty-four, 75 percent of workers with autism are under the age of thirty-nine and receive a lower average monthly SSDI benefit of \$711.90, compared to \$1,196.87 for the entire worker group, which may be a result of the lower age and shorter work history (Social Security Administration 2018b). For beneficiaries who are incapable of managing their SSDI payments, the Social Security Representative Payment Program provides benefit payment management. At 64.4 percent, workers with autism are the

group with the largest share of beneficiaries who have their benefits managed (Social Security Administration 2018b).

It has been well documented that applications for disability assistance programs increase with a macroeconomic downturn and when labor market insecurity increases. Catalano and Kennedy (1998) found a positive association between the number of individuals receiving SSI in California and the state's unemployment rate seven months earlier. Autor and Duggan (2003) found that more generous disability assistance eligibility and a declining demand for lower-skilled workers increases the likelihood unemployed workers exit the labor force through disability assistance.

O'Brien's (2013) state-level analysis finds that state GDP per capita is a significant predictor of the self-reported disability status of the working-age population, and the local unemployment rate is a significant predictor of disability status of currently employed workers. Further findings indicate that short-run downturns in the labor market are associated with higher rates of disability. The study illustrates how the state of the economy can have important implications for an individual's self-reported disability status and change the way individuals conceive of their own ability to participate in the workplace.

5.5 Small Business Share of Private Sector Jobs

The United States Small Business Administration (SBA) has a trove of data on small businesses in the United States. From this data it is possible to compile a general profile of the small business environment in the United States and its impact on the economy. The total share of the workforce employed by small businesses is shrinking, as the share of mid-sized and large enterprises grows. Small businesses (under 500

employees as generally defined by the SBA Office of Advocacy) employed 57.72 percent of total workforce in 1993 and 52.63 percent in 2018. Yet, these businesses make up 99.5 percent of all private firms. Firms with 1,000 and more employees provided 40.39 percent of all private sector jobs, but account for only 0.21 percent of the firms (U.S. Bureau of Labor Statistics 2019).

Microbusiness employers (defined as firms with one to nine employees) are the most common kind of employer firm, but they account for a relatively small share of employment. In 2018, the 3.98 million microbusiness employers in the United States made up 74.64 percent of all private-sector employers and provided 10.09 percent (12.35 percent in 1993) of the private-sector jobs. Firms with 1,000 and more employees provided four times the number of jobs as microbusiness employers (U.S. Bureau of Labor Statistics 2019). In addition to microbusinesses, there were another twenty-four million nonemployer businesses (defined as a small business that has no paid employees) in 2015. This is up fifty-eight percent since 1997 (SBA Office of Advocacy 2017).

However, in terms of job creation, businesses with fewer than 500 employees created two out of three net new private-sector jobs since the end of the Great Recession. This means smaller businesses outpace larger enterprises in job creation. That said, there may be more risk associated with small business. From 2005 to 2015, an average of 78.5 percent of new establishments survived one year; about half of all establishments survived five years or longer; and about one-third of establishments survived ten years or longer (SBA Office of Advocacy 2017).

6. THE SOCIAL ENVIRONMENT

In evaluating the social environment in which the issue of inclusive employment is placed, a brief social history is warranted as well as a look at the attitudes and perceptions of those who are in a position of hiring and managing people with ASD. What are the trends in the social and cultural environment that impact employment?

6.1 A Brief Social History of Autism

The eighteenth-century British natural philosopher and scientist Henry Cavendish left behind a considerable legacy of discoveries and methods of experiments. Cavendish is also a popular subject for a retrospective diagnosis of Asperger's Syndrome. Neurologist and author Oliver Sacks, who profiled Temple Grandin in *An Anthropologist on Mars*, made his case in the journal *Neurology* in 2001 (Sacks 2001). More recently author Steve Silberman opens his book *NeuroTribes* (2015b) with a vivid description of Cavendish's oddities and eccentricities that would suggest an Asperger's diagnosis.

A cursory Google search yields a number of results where an autism label is applied to geniuses throughout history including Wittgenstein, Newton, and Mozart. In the article *The History of Ideas on Autism*, Lorna Wing (2007) writes there can be no doubt that famed 18th-century feral child Victor of Aveyron was autistic. However, Sacks himself cautions in a 2004 letter to the editor in the journal *Nature* that "there is a danger of going overboard on the subject of pathology and creativity" (Sacks 2004).

Although these retrospective diagnoses suggest that autism spectrum disorder as a condition is not a recent phenomenon and likely as old as humankind itself—Temple Grandin likes to joke that a caveman with autism invented the spear (Grandin 2010)—its definition and diagnosis has a more recent history. The modern understanding of autism

has roots in child psychiatry and the more controversial discipline of psychoanalysis established in the late nineteenth century by Sigmund Freud. And Freudian ideas provided a lasting impact in the world of autism.

Swiss psychiatrist Eugen Bleuler may have coined the term autism in 1910 as he described “autistic withdrawal of the patient to his fantasies” in schizophrenic patients (Kuhn 2004). He coined the term schizophrenia just two years earlier. A contemporary and acquaintance of Freud, Bleuler explained that he intended autism to be in the same realm as Freud’s autoerotism, which was even at the time widely misunderstood (Kuhn 2004). Freud used the word to describe hallucinatory thinking in conjunction with self-soothing (Evans 2013).

In 1926, Soviet child psychiatrist Grunya Efimovna Sukhareva used the term “autistic (pathological avoidant) psychopathy” in a detailed description of autistic traits in childhood schizophrenia (Posar and Visconti 2017). But it was Leo Kanner at Johns Hopkins University, an Austrian-American psychiatrist, who first used the term autism as a new diagnosis different from schizophrenia. In 1943, he published his findings of a cohort of eleven children “whose condition differs so markedly and uniquely from anything reported so far” in *Autistic disturbances of affective contact* (Kanner 1943). Meanwhile in Vienna, Austria, Hans Asperger was working with children with similar characteristics and he independently named his observations “autistic psychopathy.” His paper on the topic came out a year after Kanner’s article but it remained obscure until it was translated to English in the 1980s (Donvan and Zucker 2010). In *NeuroTribes*, author Steve Silberman makes the case that Kanner, having hired Asperger’s chief diagnostician in the late 1930s, must have been familiar with Asperger’s work.

Kanner's and to some extent Asperger's concept of autism changed the narrative from mental deficiencies like idiocy, imbecility, and feeble-mindedness in the nineteenth century to the Freudian concept of childhood schizophrenia in the early twentieth century to inborn, infantile developmental disturbances in the mid-twentieth century. The word autism was soon used in this latter sense only (Kuhn 2004). Kanner himself writes that it was possible that some of his children were viewed as feeble-minded or schizophrenic and several children from his original cohort had been introduced to him as idiots or imbeciles (Kanner 1943).

However, the Freudian origins of autism were not easily eradicated. Although Kanner correctly posited autism as innate and inborn, he also observed that these children had “very few really warmhearted fathers and mothers” and questioned the role of these factors on the condition of the children (Kanner 1943). With Leo Kanner laying the foundation, and later psychoanalysts like Bruno Bettelheim—whose work has since been discredited—pushing the Freudian ideas of subconscious injury—inflicted by the mother—the tone was set. In *Time* in 1948, Kanner was quoted as describing the parents of autistic children as cold perfectionists and the children themselves as having been “kept neatly in a refrigerator which didn't defrost” (Time 1948). This provided the impetus for the infamous phrase “refrigerator mother” later pushed to the public by Bettelheim. Although Kanner later walked back his comments in 1969 and called it a misunderstanding, the damage was done to create stigmas for decades (Donvan and Zucker 2016).

The refrigerator mother theories came on the tail end of the earlier eugenics movement of the late nineteenth and early twentieth century, which is perhaps the most

hostile era for people with intellectual and physical disabilities in American history (Grossberg 2011). The eugenics movement of the early twentieth century held that certain degenerative conditions should be eradicated by science to create a better society. This included marginalization of the feeble-minded and planned restrictions on the reproduction of “inferior grades of humanity” (Stahnisch 2014). In the United States, the eugenics movement culminated in the sterilization laws and the Supreme Court decision in *Buck v. Bell* in 1927. Justice Holmes opined that “it is better for all the world, if instead of waiting to execute degenerate offspring for crime, or to let them starve for their imbecility, society can prevent those who are manifestly unfit from continuing their kind” (*Buck v. Bell* 1927).

In 1939, a year after Kanner starts observing and chronicling the lives and behaviors of his eleven patients, and a year after Asperger delivers a talk at the University Hospital of Vienna in which he describes “autistic psychopathy,” Nazi Germany officially adopts a state euthanasia program guided by the phrase “life unworthy of life.” Historians put the total number of victims at around 300,000 (Chase 2017). The Nazi program was partly modelled on American thinking and legislation, but as the horrors of Nazi eugenics became known in the mid- and late 1940s doubts about eugenics and sterilization increased dramatically in the United States. Nevertheless, sterilization continued in many states through the 1950s (Grossberg 2011).

While the refrigerator mother concept started to take hold in the 1950s, there were counter currents and parallel developments. In 1953, Dale Evans Rogers’ account of her daughter with Down’s Syndrome in *Angel Unaware* became a national bestseller and changed the way American society looked at children with special needs as something of

which parents need not be ashamed (Grossberg 2011). A little more than a decade later, in 1964, Bernard Rimland, father of a child with autism, published *Infantile Autism: The Syndrome and Its Implications for a Neural Theory of Behavior*, which countered the then-dominant psychogenesis refrigerator mother theories. A year later Rimland and other parent advocates like Ruth Sullivan founded the National Society for Autistic Children. While Bettelheim doubled down on blaming mothers in the sixties, Kanner “acquitted” parents (Donvan and Zucker 2016).

The 1970s and early 1980s saw a further shift in how the public viewed autism and disability in general. At the start of the 1970s, the United Nations adopted the Declaration of the Rights of Mentally Retarded Persons to respect the dignity of the mentally disabled. Around the same time, Wolf Wolfensberger popularized the concept of normalization in which he drew attention to the contemporary exposure of inhumane conditions in institutions and the notion that community integration makes normative lifestyles possible and desirable for people with a disability. The term became synonymous with deinstitutionalization and was regarded as the conceptual precursor to the 1975 Education for All Handicapped Children Act, which mandates a free, appropriate, public education for students with a disability (Mann and Van Kraayenoord 2011). That Act itself was preceded by the 1972 landmark decision in *Mills v. Board of Ed. of Dist. of Columbia*, which held that schools have an obligation to provide whatever specialized instruction that will benefit children with disabilities. In addition, as highlighted in the political environment section of this research, 1973 saw the implementation of the Rehabilitation Act and its crucial Section 504 prohibiting discrimination of people with disabilities.

Contemporaneously, another perspective gained momentum. What started with *Fundamental Principles of Disability* by The Union of the Physically Impaired Against Segregation in the United Kingdom in 1976, grew into a new model of disability. In 1983, Mike Oliver published *Social Work with Disabled People* and introduced the social model of disability, which, in contrast to the medical model that focuses on impairment of the individual, locates disability in an excluding and oppressive social environment and the disabling barriers faced in society (Marks 1997; Oliver 2013).

With autism still a rather obscure condition, popular culture provided an important catalyst in the late 1980s. Temple Grandin's groundbreaking *Emergence: Labeled Autistic* was published in 1986, making her the most famous person with autism in the world (Donvan and Zucker 2016) and Hollywood introduced the world to an autism blockbuster with *Rain Man*. The latter movie was the highest-grossing film of 1988 and won four Oscars at the subsequent Academy Awards (Silberman 2015b). Darold Treffert, a clinical professor who had reviewed the script for the movie, commented that few disabilities will ever experience a massive public awareness boost in such an empathic and popular format the way that *Rain Man* did for autism (Treffert 2011).

Media coverage and general autism awareness subsequently grew exponentially in the 1990s. Even when considering the proliferation of media, a search in the LexisNexis news database shows results on autism or autistic grew from a few hundred in the 1980s and 1990s to thousands in the 2000s and 2010s. Using Google Books' Ngram Viewer, a similar trend emerges with the keywords autism and autistic.

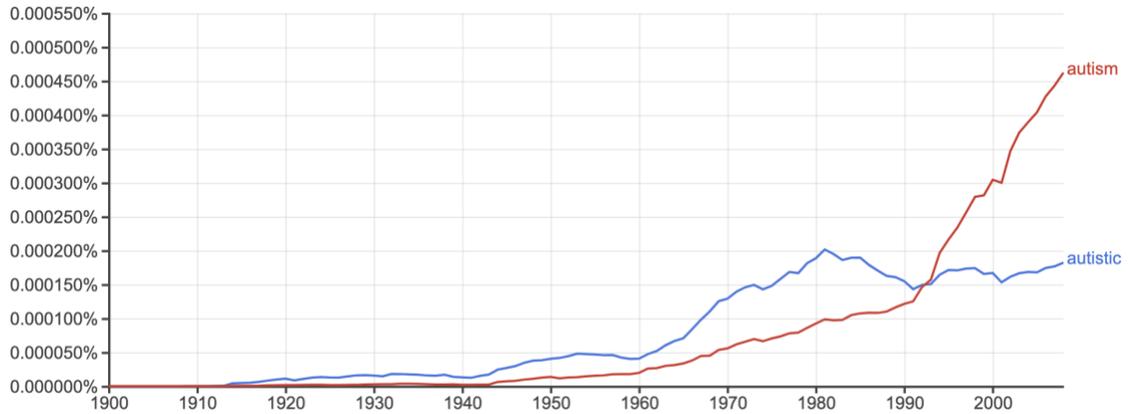


Figure 2. Google Books Ngram Viewer Autism Keywords.

However, this exponential growth in media coverage was due to a decidedly negative perspective on autism. Based on reports that services for autism had sharply risen from the late eighties to the late nineties, news media started reporting on an autism “epidemic” in the late 1990s, and incredible damage was done with Andrew Wakefield’s fraudulent study in 1998, which was retracted only in 2010 (Donvan and Zucker 2016).

In 2005, on the heels of an NBC special “Autism: The Hidden Epidemic” a national organization called Autism Speaks was founded. The nonprofit soon displaced the Autism Society of America as the premier national organization. Although the organization reached new heights with public autism awareness campaigns and had tremendous policy successes, Autism Speaks played up the medical model and the supposed epidemic in need of a cure narrative for years. Only in 2016, did it drop the word “cure” from its mission statement.

In the 1990s, self-advocates started applying the social model of disability to autism as well. In a seminal 1993 presentation at the International Conference on Autism in Toronto, Jim Sinclair addressed parents who may grieve over the loss of a “normal child” and told the audience not to mourn “losing” a child to autism. Sinclair continued:

“Autism isn't something a person *has*, or a ‘shell’ that a person is trapped inside. There’s no normal child hidden behind the autism. Autism is a way of being. [...] It is not possible to separate the autism from the person” (Sinclair 1993). In 1996, Judy Singer coins the term neurodiversity in her honors thesis for the University of Technology, Sydney. The term is a portmanteau of neurological and diversity. Over the next decade, the neurodiversity perspective grew due to the emergence of the self-advocacy movement, communication technology, and the internet as a distribution network (Bagatell 2010).

A year after Autism Speaks was founded, the Autistic Self Advocacy Network was founded by autistic people like Ari Ne'eman, who later served on the National Council on Disability. The organization gained notoriety in 2007 in response to New York University Child Study Center’s “Ransom Notes” campaign in which autism was cast as a kidnapper holding kids hostage. ASAN successfully launched a campaign to pull the advertising as the ads reflected old and damaging stereotypes. This turned out to be a pivotal moment for ASAN and the concept of neurodiversity (Donvan and Zucker 2016).

As shown in Figure 3 and Figure 4, terms including autism awareness and neurodiversity, and employment-related terms such as workplace diversity and inclusive workplace, have all increased steadily in books and popular culture since the 2000s. There is perhaps a parallel historical path described here in how society views autism and disability in general and the shift in public policy and employment, from sheltered workshops and charity to competitive integrated employment and a distinct competitive advantage of a neurodiverse workforce.

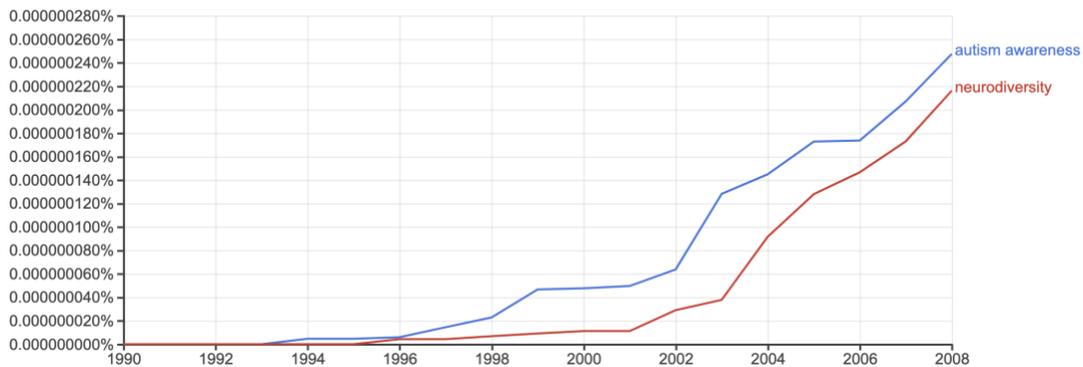


Figure 3. Google Books Ngram Viewer Awareness Keywords.

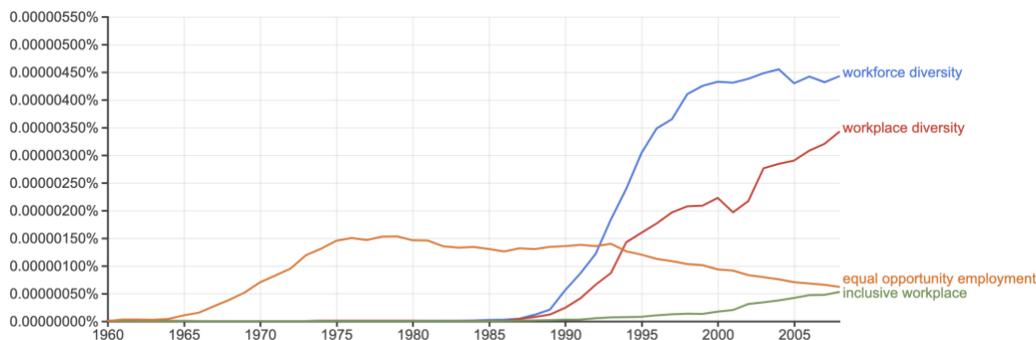


Figure 4. Google Books Ngram Viewer Workplace Diversity Keywords.

6.2 Stigma and Perspectives from Individuals with ASD

Autism has a recent social history and the opinions and beliefs about the condition are relatively new and rapidly evolving. There is limited research about the attitudes, perspectives, and opinions on autism in an employment environment and its implications for hiring. More is known about disabilities in general and how stigma impacts perceptions and attitudes. Jones, Farina, and Markus (1984) noted that responses to stigmas, including disabilities, vary based on six dimensions: concealability, course (recovery or response to treatment), disruptiveness (interference in communication and interaction in the workplace, later called performance impact by McLaughlin, Bell, and Stringer (2004) and Beaty and Kirby (2006)), peril (or dangerousness), origin, and

aesthetics (displeasing nature of the disability). It is important to note here that these six dimensions are based on responses to stigma, or in other words how others perceive the stigma. In other words, in the dimension of origin, it does not necessarily matter what science says about the biological and genetic factors of autism, but rather whom others think is responsible for the onset of the disability. This may be pertinent with a connection to the history of autism where first mothers were blamed and later, even persisting through today, vaccines. Furthermore, autism is of course a spectrum and its measure of severity will result in a large variability in how others see the stigma, particularly perhaps in the dimensions of concealability, disruptiveness, peril, and aesthetics.

McLaughlin, Bell, and Stringer (2004) found that performance impact (disruptiveness) was the only stigma factor significantly related to acceptance by coworkers. In other words, if disability was perceived to—with the emphasis on perceive—decrease an individual's job performance, they were more stigmatized by their coworkers. The authors further suggest that other five stigma factors have a less direct implication for the work role and may have been affected by social desirability bias.

Concern about stereotypes and stigmatization is a core reason why people with ASD may not disclose their condition in the workplace or only disclose to supervisors or coworkers whom are perceived as supportive (Johnson and Joshi 2016). Finding ways to talk about a disability in the workplace requires a difficult balancing act and there is a complex interplay of stigma expression and suppression (Sarret 2017; Johnson and Joshi 2016). Disclosing a disability and receiving accommodations can lead to stigma and

limited career opportunities and studies have shown that mental health related disabilities are related to more workplace stigma than physical disabilities (Sarrett 2017).

Not disclosing could create difficulties when seeking protections or accommodations. It is generally the responsibility of the individual with a disability to inform the employer that an accommodation is needed. However, disclosing a disability is not required for ADA discrimination claims under the third prong of disability in which an employee can be regarded as having an impairment. In *Brady v. Wal-Mart Stores, Inc.* in 2008, the Second Circuit Court held that an employer has a duty to accommodate an employee's disability if the disability is obvious. The court understands this to mean if an employer knew or reasonably should have known that an employee was disabled. Even where an employee does not disclose or does not regard himself to be disabled, if an employer has independent knowledge of an employee's disability or regards the employee as having a disability, this would hold an employer accountable and liable for accommodations.

People diagnosed at later stages have been in the workforce for decades and may or may not have disclosed their condition or may or may not have been regarded as disabled. However, people receiving a diagnosis while already well into a career expressed relief to be able to understand and pinpoint their workplace challenges (Sarrett 2017). One such challenge is the job interview. Perhaps the most crucial step towards getting hired in a competitive employment environment. People with ASD report common communication challenges in the job interview process: expressive language, eye contact, general anxiety, and knowing how to respond to "trap" questions, where participants reported having difficulties knowing when to lie and when to tell the truth

(Sarrett 2017). A benign and common question like describing one's weaknesses can easily become a barrier for people who may answer such a question too directly and truthfully. Deficits in soft skills like conversational focus and body language may be difficult to conceal in an interview setting. Many individuals with ASD may not be able to get beyond the initial employment interview (Hensel 2017). Nasamram, Witmer, and Los (2017), in analyzing data from the NLTS-2, found that social skills were a significant predictor of three postsecondary outcomes for young adults with ASD, including employment. Although VR programs and other services hold mock interviews and train people on interviewing skills, one way of addressing the challenge is to move the onus from the individual with autism to the employer and make the interviewing process more accessible to people with ASD (Sarrett 2017). More recommendations will follow in subsequent sections.

Lorenz et al. (2016) in a small study of sixty-six individuals found three main categories of barriers to job attainment and retention of people with ASD: social, formality, and job demand problems. Specific barriers in these categories named most frequently were communication (e.g. misunderstandings in social communication) and colleagues (e.g. working in a team) for social; equipment and environment (e.g. placement into an open plan office), work routine (e.g. unclear work instructions), and job application (e.g. finding matching jobs and the application process) for formality; and cognitive (e.g. multitasking troubles) and stress (e.g. loneliness and dejectedness) for job demand problems.

6.3 Employer Perceptions and Attitudes

Employer attitudes towards employees are an important factor in the employment rate of people with disabilities (Unger 2002). There is a body of literature on employer perceptions of people with disabilities that has developed over the last decades. The last major systematic review of such research by Ju, Roberts, and Zhang was published in 2013 and built on the work by Hernandez, Keys, and Balcazar (2000) and Unger (2002). These reviews have attempted to find common employer factors associated with favorable attitudes towards hiring or working with people with disabilities, from previous work experience to type of business or industry or business size. A large number of studies have examined global attitudes toward people with disabilities, using instruments like the Attitudes Toward Disabled Persons Scale. Others have studied employer attitudes specifically. Although some of that research has specifically looked at intellectual, developmental, and psychiatric disabilities, there is limited research on employer perceptions of people with autism spectrum disorder.

Hernandez, Keys, and Balcazar (2000) found that although employers were likely to have positive global attitudes, acceptance of workers with disabilities is superficial and not indicative of employing them. Employers often held more negative attitudes when asked about more specific attitudes related to employment. Additionally, Hernandez, Keys, and Balcazar found a preferential hierarchy based on disability type continued from a previous literature review: physical disabilities are viewed more positively than intellectual or psychiatric disabilities. Other trends included (1) positive previous experiences are related to positive attitudes; and (2) positive attitude toward individuals placed by VR and in supported employment. Two previously established trends appear to

be diminishing since a 1987 Greenwood and Johnson review of the prior forty years: (1) a discrepancy between willingness to hire and actual hiring, and (2) employers of larger companies reporting more positive attitudes than those of smaller ones.

Unger (2002) found that employers may be willing to sacrifice quality in exchange for dependability and that concerns about hiring people with disabilities may derive from misconceptions rather than direct experience. In a subsequent review of fifteen studies in the decade since the Hernandez, Keys, and Balcazar and Unger reviews, Ju, Roberts, and Zhang (2013) found a new trend that employers increasingly recognize that the costs of hiring individuals with disabilities are reasonable and accommodations incur minimal costs. Compared to the previous reviews, employers identified fewer concerns and more benefits. However, some trends remained, including more negative attitudes toward intellectual and psychiatric disabilities and smaller companies were still less likely to hire people with disabilities due to cost concerns. Direct experience and experience with VR and supported employment continued to have a positive influence on employers' attitudes (Ju, Roberts, and Zhang 2013).

There is very limited research on the scale of engagement of employers with VR services. In a national survey of 382 hiring managers, McDonnall (2017) found that just over 38 percent of managers had ever communicated with their respective state's VR agency about employing people with disabilities. Nearly half of those who had only did so once or were no longer in touch and just over 23 percent had an ongoing relationship with someone from the agency. That translates to an overall less than 9 percent of hiring managers who are in an ongoing relationship with a VR agency. McDonnall also found that the intent to hire in the future was strongest when the employer reported an ongoing

relationship and concludes that it is important for VR agencies to get out and make connections with employers (McDonnall 2017).

Among the benefits and positive attitudes reported in the Ju, Roberts, and Zhang review were dependability and consistent attendance or low absenteeism. Common concerns identified included productivity, job performance, and lack of employability and skills. Among those with psychiatric or mental disabilities, concerns included unpredictable behaviors and social and emotional skills. Ju, Roberts, and Zhang echo Unger in that the latter concerns may be the result of stereotypes of psychiatric disabilities rather than direct experiences (Ju, Roberts, and Zhang 2013).

Ren, Paetzold, and Colella (2008) found an overall positive effect of disability on performance evaluation and a negative effect on performance expectations and hiring decisions. The former is also supported by Miller and Werner (2005) who found that higher task performance ratings were awarded to individuals with disabilities, further inflated by an attribution of stigma controllability, or origin. Neither study found any evidence of a moderating effect of type of disability in performance evaluation. However, Ren, Paetzold, and Colella found negative effects of mental disability, as compared to physical disability, on performance expectations and hiring decisions.

Although disability may inflate job performance ratings, Smith et al. (2004) still found employers rate employees with disabilities lower than nondisabled employees in three specific areas of employer satisfaction: (impact on the) workplace climate, speed or rate of work, and accuracy or quality of work. Overall, however, employers were equally satisfied with employees who were disabled and nondisabled and a plausible explanation for the difference in the three areas is that employers may be expecting more problems.

People with disabilities may be presumed incompetent as has been found in research on women and minorities hired under affirmative action program (Heilman, Block, and Lucas 1992). Disability may have a negative effect on performance expectations and several studies in the review by Ju, Roberts, and Zhang cited job performance as a concern.

Research by Gilbride, Stensrud, and Vandergoot (2003) suggests employers vary in openness to hiring people with disabilities and that there are specific organizational characteristics that increase this openness. These characteristics are broken down into work cultural issues (e.g. employers welcome diversity and the management style is more personal and flexible); job match (e.g. employer focuses on capabilities to match with job requirements and essential job functions rather than marginal functions); and employer experience (e.g. ability to supervise a diverse workforce and viewing support and rehabilitation agencies as a partner).

7. THE TECHNOLOGICAL ENVIRONMENT

Advances in technology play a crucial role in business from changing the nature of work to impacting a firm's competitive strategy. The Industrial Revolution and its steam engine and factory automation produced major societal shifts from rural farming to urban non-farming jobs. More recently, computing technologies represent another paradigm shift (National Academies of Sciences 2017). This section will cover how technology impacts the employment environment for people with ASD in potential job creation and elimination, shifts in worker experiences and functions and what kind of skills and education is needed, and new modalities of employment.

7.1 Trends in Technology and Employment

The main trends in the advancement in the technological environment are digitization, meaning moving data and services to computers and the cloud; computing power and networks, with chips getting more powerful, networks getting larger and faster, and mobility increasing, all exponentially; and machine learning and robotics increasing the use of big data and automation of more complex tasks with advances in artificial intelligence and natural language processing (National Academies of Sciences 2017). The impact these advancements have on employment and the workforce is pervasive and follows from two distinct factors: invention and diffusion. The invention of new technologies by itself does perhaps little to create change; it is about how they are deployed in the market and applied to the existing structures. Technology is a mere instrument of change. The complex interactions between this instrument and organizations, skills, markets, policies, and values is what shapes its final impact (National Academies of Sciences 2017).

7.2 The Digital and Gig Economy

In the section on the economic environment, the modality of employment was explored: sheltered work centers, supported employment, and competitive employment. Although freelance and contract work are not new concepts, technological advancement and economic trends have created a subset of competitive employment: the so-called gig economy. Uber is perhaps the best-known face of the gig economy in which labor is provided on a short-term basis via digital platform technologies (Lobel 2017). Uber and other companies like Airbnb and TaskRabbit emerged from advances in digital technologies, increasing connectivity and availability of mobile devices, and macro-environmental economic and cultural shifts and preferences (Lobel 2017).

Gallup data from 2018 suggests that 36 percent of United States workers participate in the gig economy through either primary or secondary jobs. The trend is often dichotomized between positive elements like empowerment and entrepreneurship and negative signals like the deterioration of the social contract between employers and employees (McFeely and Pendell 2018). However, despite this dichotomy being discussed aplenty in the media and in popular culture, the depth of the empirical evidence base is shallow. Healy, Nicholson, and Pekarek (2017) suggest a significant research effort will be required to develop an understanding of the gig economy and how people work in it.

Changing job structure in the digital economy leaves a gap in the protection of rights for people who are disabled. Looking at disabled app developers in atypical employment, Krutzinna and Floridi (2018) find two major gaps in protecting the rights of these digital economy workers: a failure to collect relevant data on disability in these

employment settings (despite the 2014 amendments in the Rehabilitation Act to focus on applicants' self-identification and collect data) and a lack of accountability towards the workers. Lobel (2017) suggests that the distinction between independent contractor and employee continues to present definitional challenges in the gig economy. In 2015, the Department of Labor issued guidance that under the Fair Labor Standards Act, a worker who is economically dependent on an employer is "suffered or permitted to work" by the employer. The "suffer or permit" concept has broad applicability and is critical to determining whether a worker is an employee and entitled to the FLSA protections (U.S. Department of Labor 2015).

The FLSA does not cover discrimination cases, but the Rehabilitation Act and the ADA do. However, the ADA requires that the defendant be the plaintiff's employer (*Flynn v. Distinctive Home Care* 2016). Although the Rehabilitation Act adopts the standards under the ADA, some courts have held that it does not incorporate this particular limitation of the employer-employee relationship and an independent contractor can sue for employment discrimination under Section 504 of the Rehabilitation Act. The Circuit Courts are split on the issue, and the Supreme Court has not resolved this split (*Flynn v. Distinctive Home Care* 2016).

The question of benefits is also important in the gig economy. In the United States, most benefits including health care and retirement are linked to employment (Lobel 2017). Independent contractors who are disabled will have to keep an eye on their Substantial Gainful Activity in order not to lose their SSDI and SSI benefits. And although independent contractors typically don't qualify for employer-provided health insurance, the Affordable Care Act (ACA) of 2010 allows these workers to purchase

coverage. Lobel (2017) argues the ACA has in effect become a human resources site for the gig economy and has made workers free to pursue alternative means of employment like entrepreneurship and piece-work without having to worry about quality health coverage.

7.3 The Impact of Technology on Required Skills

Reporting in the media tends to overstate the scale at which automation replaces labor. Doomsday predictions of machine substitution for human labor around for hundreds of years but have not come to pass. Although technological advancements did and will continue to eliminate *particular* jobs, there are little consequences to the overall, total employment rate. Changes in technology do alter the nature and types of jobs available and what those jobs pay. The skill-biased technological change hypothesis poses that technology can be a complement for highly-skilled workers, who disproportionately receive the wage gains, and a substitute for low- or medium-skilled workers (Autor 2015; National Academies of Sciences 2017). As the spectrum of autism covers people with a wide range of intellectual abilities as well as a wide range of support needed, this may have more negative implications for those on the spectrum that require more support and those who are underemployed. There has also been a trend of an increased wage premium associated with a college degree despite the number of college graduates increasing. Siegel (1999) found that technological change is associated with a shift in labor force in favor of workers with higher levels of education. As reported, individuals with autism have lower college enrollment and poorer post-secondary education outcomes.

Computers and artificial intelligence are still poor at simulating human interaction. That is one plausible explanation why Deming (2017) finds that there is a growing demand and increasing rewards for social skills in the labor market. In more recent years, social skills were also a stronger predictor of employment and wages compared to earlier decades of the 1980s and 1990s (Deming 2017). This may be particularly troubling for people with ASD who have persistent deficits in social communication and social interaction. In fact, as we've seen earlier social skills were a significant predictor of postsecondary outcomes and are reported as a main barrier to job attainment.

7.4 The Impact of Technology on Hiring and Training

In the age of big data and algorithms, companies are exploring artificial intelligence (AI) in the hiring process. The *Wall Street Journal* reported in 2017 on Unilever's ditching of resumes and traditional campus recruiting in favor of online ads and applications, playing online games, and submitting videos. A series of algorithms then selected candidates for follow-up interviews (Gee 2017).

An algorithm, however, is only as good as the data on which it is based. The concept of garbage in, garbage out points to the dangers of inherent prejudices in the data (Barocas and Selbst 2016). In a recent scenario, Amazon shut down its job application AI system. The data in the system came from historical hiring—those already hired at the company. As the workforce had been mostly men, the AI learned to penalize women in job applications (Cohen 2019). For the autism community, the opportunity with resume-scanning algorithms is that there is less of a focus on soft skills and social skills and more of a focus on essential job functions and task-related skills. However, applicant scoring

may be biased against less traditional educational and career paths. Individuals on the spectrum may not always pursue those traditional paths.

New technologies like virtual reality are making their way into society in all kinds of ways. A recent systematic review of the effectiveness of virtual reality found moderate evidence that virtual reality-based treatments can help children with ASD (Mesa-Gresa et al. 2018) and individual studies have found virtual reality a promising tool for improving social skills, cognition, and functioning in autism (Kandalaft et al. 2013). In 2016, a British advertising agency produced a virtual reality experience for the UK's National Autistic Society "Too Much Information" campaign to make the public aware of the sensory struggles people on the spectrum may experience when visiting a mall (Reynolds 2016). More recently, NPR reports that Walmart is training more than 1 million employees using virtual reality including teaching cashiers to show greater empathy (Noguchi 2019).

The implications here are that virtual reality could be used for work-related behavior training for people on the spectrum. Chen et al. (2015) note several studies have explored and found success with video modeling and audio cueing in offering vocational supports. Studies have found initial evidence that video models and virtual reality may be efficacious to enhance job interview skills for adults with ASD (Strickland, Coles, and Southern 2013; Smith et al. 2014). Virtual reality-based training improved job interview skills, simulated interview scores, and self-confidence. Though a small sample size, a follow-up study from this same cohort found that the virtual reality training enhanced competitive employment outcomes (Smith et al. 2015).

8. BUSINESS CASES

With the four domains of the macro-environment explored, this next chapter covers four companies that have specific programs to increase their neurodiverse workforce. These business cases shine a light on the real-world, practical implementations of solutions to build a more inclusive work environment.

8.1 The Dandelion Principle

The idea behind SAP's Autism at Work program has its origins in Denmark. In 2004, Danish entrepreneur Thorkil Sonne started his consulting company Specialisterne ("The Specialists" translated in English) after the ASD diagnosis of his third son. Inspired by his son, Sonne decided to use the unique abilities common in autism like strong memory and orientation on detail as well as motivation to follow processes and standards as a competitive advantage. The majority of his employees have an ASD diagnosis and work as consultants on projects that are particularly suited to their abilities including software testing, programming, and data entry. Sonne was arranging working conditions to align with abilities. The dandelion principle was born (Austin and Sonne 2014).

The dandelion principle stems from a metaphor. Many people in their aim to maintain pristine green lawns consider the dandelion a nuisance. However, the dandelion has so many inherent positive qualities and health benefits that it may seem strange the plant is commonly regarded as a weed. The metaphor is about context. Within a perfectly manicured lawn, the plant is out of place. But in places that "don't call for uniformity, we can appreciate the dandelion's distinctive attributes" (Austin and Sonne 2014). The dandelion principle then is the alternative to trying to fit every employee into predefined contexts; it is about managing people individually and designing contexts that are aligned

with unique abilities. But Sonne wanted to scale beyond his own consultancy. He started a nonprofit foundation committed to creating one million jobs through “social entrepreneurship, corporate sector engagement, and a global change in mindset” (Specialisterne n.d.).

8.2 SAP

In recent years, a few large enterprise corporations have been in the media spotlight for their inclusive hiring practices and programs. One of the first major companies to jump in was SAP, the world’s fourth-largest software company headquartered in Germany. The firm announced its Autism at Work program in May 2013 with the stated goal of having people with autism comprise 1 percent of its employee base by 2020 (translating to a little under 1,000 employees). The 1 percent was chosen because it makes the proportion of people with ASD in the firm’s workforce roughly equal to the proportion in society as a whole. To date, the program operates in thirteen countries and employs more than 160 workers with autism (SAP SE n.d.b).

Inspired by Sonne, V.R. Ferose, a managing director at SAP Labs in Bangalore, and his assistant Sridhar Sundaram, launched an initiative that worked with kids to explore how technology could improve their lives and placed a small number of people with ASD in the SAP Labs workplace. Anka Wittenberg, who was appointed as SAP’s Chief Diversity and Inclusion Officer in March 2013, was impressed and worked behind the scenes, and with Sonne’s Specialisterne, to launch a program to build on the promise of Ferose’s initiative (Pisano and Austin 2016a).

In launching the program, SAP framed it not as charity or corporate social responsibility, but rather in terms of contributions to a corporate goal of innovation and

managing diversity. The program was to be sustainable based on its business value, not based on good corporate citizenship. Furthermore, it was based on the idea that this program would lead to an improvement in human resource policies and processes to such an extent that hiring a neurodiverse workforce did not require a separate, parallel onboarding process, in effect making the program itself obsolete. Launching in multiple countries, local partners were crucial in identifying candidates and helping SAP navigate the complex environment of local public programs, policies, and regulations. Candidates were sourced from nonprofits and vocational rehabilitation services, universities and colleges, and the SAP employee network. Jobs filled by Autism at Work participants included a wide range of roles such as software developer, business analyst, software testing, IT support, graphic designer, marketing operations, and HR service associate.

Many employees had never worked in corporate environments, so seemingly simple soft skill issues could prove difficult. Onboarding started with a week of soft skills training, followed by a “Lego Hangout Day” where candidates are grouped and given Lego Mindstorm robotics kits with the goal to gauge several skills. This was followed by another 5 weeks of SAP onboarding and pre-employment training in partnership with vocational services and local nonprofits. At the same time, SAP divisions where these new hires would be placed received awareness and sensitivity training. Only after this process and training were candidates matched with jobs. Some would land immediate jobs and others received opportunities a few weeks or months after training, others still were referred to other employers or received temporary jobs from local partners.

To maximize the chances for success after the hire, the Autism at Work program designed a support structure with two circles: workplace and personal. The workplace

support circle included a team manager, a job and life skills coach, an Autism at Work mentor, a team buddy, and an HR business partner. The personal support circle consisted of people external to SAP and often the job and life skills coach was also part of the personal support circle and was typically a member of a local partner organization.

8.3 DXC Technology Company (Hewlett Packard)

Computer giant Hewlett Packard connected with Sonne and Specialisterne to create the Dandelion Program in contracting with Australia's Department of Human Services in 2014. In 2016, the program had placed nearly forty employees with ASD to perform software testing. Hewlett Packard has since spun off the division that housed the program and it is now part of a new company DXC. In the most recent reporting for 2018, the program had established seven teams across four states in Australia, employing more than eighty people on the autism spectrum (DXC Technology Company 2019).

The unique defining feature of the DXC Dandelion program is the "pod" structure. The pod is described by Pisano and Austin (2016b) as a self-contained mini ecosystem and incubator. Similar to SAP's circle of support, the structure was designed with two goals: providing a safe environment for program participants and providing experiences to help team leaders manage people with autism. A typical pod consists of fifteen to nineteen members: nine to twelve entry-level testers with ASD, three to four experienced lead testers (without ASD), a testing manager, a service delivery manager, and an ASD support manager.

Like the managers that stood up the SAP Autism at Work program, the executive sponsors at DXC were expecting the program to be commercially viable and not be considered charity. In fact, leaders resolved the program should outperform other

approaches and improve, what was then Hewlett Packard, competitive advantage. In the software testing pods contracted by the Australian DHS, the Dandelion program teams were 30 percent more productive than the average testing team. Participants with ASD in the Dandelion pods possessed specialties particularly suited to the job: strong focus, excellent memory, and thoroughness on repetitive tasks Pisano and Austin (2016b).

The DXC Dandelion program plan is centered around a three-year roadmap. Year one is focused on job awareness and onboarding; year two concentrates on self-advocacy and understanding one's own strengths and needs to cultivate independence and confidence; and year three is centered around transition to be ready for a career outside of the support structure (DXC Technology Company n.d.).

To find a suitable pool of candidates, the company worked with local and social organizations. Recruitment emphasis was placed on sustainability, which required a change in perspective from these social organizations that often operated with a needs-based outlook. The question was not who needs most help but who is most likely to remain in the program the full three years (Pisano and Austin, 2016).

8.4 Covering the Whole Spectrum: Hart Schaffner Marx

Where SAP and DXC recruited people with ASD that were often academically successful and who possessed perhaps a better ability to manage their ASD-related difficulties in the workplace with or without accommodation, representatives from these companies acknowledged in the 2018 Autism at Work Summit that they needed more expertise to employ a larger number of people from a wider range of the spectrum (Austin 2018).

Doug Williams, CEO and owner of classic American suit maker Hart Schaffner Marx and father of a son on the spectrum, began working with Autism Workforce in 2014 to implement an autism-ready work design. Williams wanted to make employment accessible to a much wider group of people with ASD. These people however would require more support to do their jobs well. Another challenge was that the factory environment, especially compared to the white-collar setting of software companies like SAP and DXC, was noisy and complex and could cause sensory-sensitive people with ASD distress. Still, Williams stressed, this was not a charity program and the goal was to hire the best person for the job (Austin, 2018). His first task was to identify positions that would be suitable for people in the autism program.

Ambiguity in a job may be a difficult obstacle for people with ASD who may require clearly defined, clearly documented, and specific descriptions. Processes that neurotypical people understand without explicit instructions may require a different, more specific way of communication. Experts from Autism Workforce assisted in job design and helped develop checklists, signage, and navigational aids. Job descriptions featured elements that were not usually present in listings like physical requirements and a description of the sensory environment. This allowed better decisions who would be the right fit, from both the applicant and job coach perspective as well as the company's perspective. Candidates would tour the facility first so they could understand the work environment and for the company to notice any immediately apparent major challenges.

Similar to SAP and DXC, onboarding was slow and deliberate with step-by-step instructions for the employees and responsibilities added one at a time. In the meantime, HSM provided what it called staff enlightenment to prepare colleagues and managers for

what to expect from co-workers with autism. A unique innovation stemming from HSM's program was the development of mock interviews for the community. HSM and Autism Workforce reached out to local service organizations and high schools to invite anyone with a disability to take part in practice interviews. This had three benefits: it helped people with disabilities get better at interviewing; it helped HSM HR staff learn more about interviewing people with disabilities; and it helped the company identify potential candidates to bring in for the program.

As of 2018, HSM has been able to integrate seven people with ASD in different jobs across four departments. Williams described a general "feel-good" factor that affected the entire organization. Participants brought a focus and productivity and due to the common discomfort for inconsistency and disorder in people with autism, employees often found better and more efficient ways of doing things. The theme that emerged was that the changes brought on through the program led to more efficient management across all departments and employees, not just those with ASD.

8.5 The Rise of Parent Entrepreneurs: Rising Tide

Of the hundreds of examples of small or microbusiness social enterprises, nearly all started by a parent of a child or young adult with autism, Rising Tide in Parkland, Florida is perhaps the best-publicized, with coverage from *Inc. Magazine* to *NBC News*, and most successful example with ninety-two individuals with autism hired to date (Rising Tide Car Wash n.d.). In 2011, entrepreneur John D'Eri was struggling with envisioning a future for his twenty-one-year-old son with ASD Andrew. After a brainstorm session and he settled on the idea of a car wash. With the help of partners Sonny's Enterprises, a large manufacturer of car wash systems, and the University of

Miami Center for Autism and Related Disabilities, D'Eri created a pilot in Florida City in the summer of 2012 with fourteen recruits to test if people with autism could really do the job (D'Eri and D'Eri 2014).

In a 2014 TEDx talk, Tom D'Eri, the neurotypical son now also involved in the business, explained: "What we found during that pilot was that we were hoping that people with autism were going to be able to do a really consistent job and do it under time standard. And they were certainly able to do that. But what was even more striking was that the consistency and the level of detail was off the charts" (D'Eri and D'Eri 2014). The father and son team decided that they could turn this into a competitive advantage and Rising Tide Car Wash was born. But as the elder D'Eri commented in *Inc. Magazine*: "it's not a charity. It has to be a business. The business has to stand on its own" (Chu 2015). In a podcast from 2016, D'Eri elaborated that the company must be sustained by positive work, great product, and a superior method of providing a service that the market needed. Proving the market demand, the company quickly moved from 35,000 cars per year to 160,000 cars per year (D'Eri 2016).

In collaboration with consultants, they created a detailed model and broke down the car washing process into forty-six steps. Trainees and employees need to complete these steps correctly three times in under six minutes to be hired and deployed in the car wash. Furthermore, Rising Tide implements a color code for its polishing towels. The red towel is for the body of the car; the blue towel for windows; and the yellow towel for the interior. Each towel is only used once for each car. "Can you picture a bunch of neurotypicals working for me. I'm telling them forty-six steps in a row. Red towels. Blue

towels. As soon as I turn around they'll be like: 'yeah, I'll show you what you can do with your red towels!'" jokes John D'Eri on his TEDx talk (D'Eri and D'Eri 2014).

Creating a business that employs more than eighty percent of its workforce on the autism spectrum opened Rising Tide up for criticism as well. Their idea of this social enterprise perhaps echoes the old ideas of a sheltered workshop or a segregated workforce counter to the current public policy push of integrated employment. However, John D'Eri counters that he has seen strong social bonds created by the very nature of the work. Restricted interests that may be a common trait in people with autism are not sustainable in the car wash work environment. And each employee has a role in the success. This creates empathy and social interaction. John D'Eri elaborates: "by creating them as the norm, and us as the atypicals in that environment. They created an environment of success [...] They've never had a place where they're the ones that are basically the norm" (D'Eri 2016). Jack Fagan, a director at The Arc, recalls in the book *The Autism Job Club* that, despite criticism, sheltered workshops had its own social connections and friendships that grew between workers at these places (Bernick and Holden 2015).

The team at Rising Tide put in a lot of work to create a workplace that has the structures in place to make work easier. These changes in the hiring and operating processes are needed to employ people with autism, but they translate as good business practices for a neurotypical environment as well. "Social enterprise will not drive your sales, drive your revenue, or drive that business forward," states John D'Eri. "You have to produce value, and quality, and consistency. Otherwise you won't get return business." In the end, he continues, "it doesn't move without a competent staff" (D'Eri 2016).

And Rising Tide didn't invent the car wash. All they did was apply the concept into an existing framework. In 2017, the company opened its second location and Tom D'Eri is on a mission to educate other parents on starting their own social enterprises with Rising Tide U, a program that provides a road map and online course.

9. THREATS AND OPPORTUNITIES

This paper has presented a comprehensive environmental scan of the political, economic, social, and technological factors impacting the employment of people with autism spectrum disorder, culminating in an opportunities and threats analysis. In addition, recent case studies looked at the practical implementation of programs at corporations and establishing a social enterprise around people with ASD.

Table 3. Overview of Threats, Opportunities, and Research Needs by Environmental Forces.

	Threats	Opportunities	Research Needs
General	<p>Only 2 percent of research funding goes to lifespan issues</p> <p>Broadening of the population with autism</p> <p>Overlapping disorders and comorbidity</p> <p>Poor outcomes during transition to adulthood</p>		<p>An increased look at lifespan issues</p> <p>Establishing meaningful subgroups of autism for better models and targeted interventions</p>

Table 3. Continued.

<p>Political</p>	<p>Disabled definition under ADA doesn't sufficiently consider disabling aspects of autism</p> <p>Essential job functions are framed from a neurotypical perspective</p> <p>Microbusiness employees and gig economy workers not covered under ADA protections</p> <p>Small businesses fewer HR resources and more a target of ADA claims</p> <p>Parents report a great deal of effort to obtain services</p> <p>Unpreparedness of schools to provide increasingly demanded services</p>	<p>Momentum to eliminate Section 14(c) subminimum wages and prioritize competitive employment</p> <p>JWOD, AbilityOne, 2014 WIOA, and other affirmative action focus on ASD</p> <p>Mandated role of public education system in transition to adulthood</p> <p>Increase utilization of Ticket to Work and gear towards changing employment environment like gig economy</p> <p>Small business deductions for accommodations may alleviate fears of cost</p>	<p>Measure specific effects of ADA protections on employment for people with ASD</p> <p>Measure court's understanding of ASD and its effect on ADA cases</p> <p>Support requirements to serve people with disabilities at one-stop career centers</p> <p>Reasons for underutilization of Ticket to Work among people with ASD</p> <p>Support requirements in public education for better postsecondary outcomes for people with ASD</p>
<p>Economic</p>	<p>High societal costs and lost productivity</p> <p>High unemployment rate and low labor force participation</p> <p>Underemployment: low wages, minimal hours</p> <p>Segregated work centers remain primary model for developmental disabilities</p> <p>People with ASD costly to serve in VR services</p> <p>Unfamiliarity of VR staff with ASD and variability in quality</p> <p>Economic downturn and declining demand for lower-skilled workers increases demand for disability assistance</p>	<p>Although segregated programs continue to be the primary model of service, moving away from subminimum wages</p> <p>Early signs of positive impact of relinquishing benefits for work</p> <p>Small businesses (<500 employees) create relatively more jobs, make up 99.5 percent of firms, and employ more than half the total workforce</p>	<p>Detailed breakdown of who bears the societal costs</p> <p>Detailed breakdown of factors that predict societal costs</p> <p>Measure accurate and specific employment and labor force participation rate among people with ASD with meaningful subgroups</p> <p>Measure and characterize specific ASD program job growth and creation</p>

Table 3. Continued.

<p>Social</p>	<p>Disclosing is risky and mental health related disabilities are related to more workplace stigma than physical disabilities</p> <p>Job interview is often too great a barrier</p> <p>Global attitudes towards disability may be positive; acceptance of workers with disabilities is superficial</p>	<p>Neurodiversity and self-advocacy movements provide new perspectives</p> <p>Positive results from ongoing relationship with VR; make more connections with employers</p> <p>Positive experiences are related to positive attitudes and concerns may derive from misconceptions</p>	<p>Specific attitudes toward people with ASD in the workforce</p> <p>Contact hypothesis and hiring decisions</p>
<p>Technological</p>	<p>Digital or gig economy offers fewer benefits and protections for people with ASD</p> <p>Technological advancements favor high-skilled workers, college-educated workers, and social skills</p>	<p>Digital economy can empower entrepreneurship without traditional structures</p> <p>Digital application processes can favor essential job functions and lessen focus on social skills</p> <p>Virtual reality modeling and training has initial promise in interview settings and improving functioning</p>	<p>Measure potential biases in algorithms towards people with ASD and neurodiversity</p> <p>Measure protections of people with ASD in digital economy</p> <p>Measure impact of changing skill requirements for people with ASD</p>
<p>Business cases</p>	<p>SAP may miss its stated goal of 1 percent of its employee base, raising questions about the scalability</p>	<p>Support structures to integrate people with ASD (SAP and DXC)</p> <p>Advantages and social cohesion of a majority ASD workforce (Rising Tide)</p> <p>Reframing from charity to competitive advantage (SAP, DXC, Rising Tide)</p>	<p>Measure specific results or competitive advantage factors of Autism at Work program and Rising Tide.</p> <p>Lack of empirical performance measures of Autism at Work units or pods compared to neurotypical unit in the workplace</p> <p>Cost-benefit analysis of specific programs or small businesses and hiring individuals with ASD</p>

9.1 Legal Environment

The overarching theme is that federal and state policy has not been able to make a dent in the employment of people with disabilities. There does not seem to be any evidence that legislation like the ADA and Ticket to Work significantly moved the needle for increased employment of people with disabilities. That does not mean these efforts are misguided. The ADA brought protections and there seems to be evidence that this resulted in people with disabilities retaining jobs. However, looking at some of the *prima facie* elements of an ADA protection claim, clear threats remain.

The plaintiff's employer is subject to the ADA. When the ADA is not enforceable for the millions of microbusinesses and small businesses with 15 or fewer employees or for the growing share of workers who participate in the gig economy as private contractors, there is inadequate protection of individuals with disabilities from discrimination at those places of employment.

The plaintiff is disabled within the meaning of the ADA. Since the 2008 amendments to the ADA, courts have increasingly concluded that autism specifically is protected as a disability. However, despite improvements, courts have not universally bought into considering autism as a disability under the ADA. Non-clinical, non-legal vernacular labels such as high-functioning may cause more harm than good, as they don't sufficiently consider the disabling aspects of ASD. In addition, the more recent majority view that an employee can be terminated for workplace misconduct even when the misconduct is a result of the disability raises the question if courts need a better understanding of autism and how it may affect social interactions.

The plaintiff is otherwise qualified to perform essential job functions. Essential job functions are nearly always framed from a neurotypical perspective, including communication and social skills and working independently (without explicit instructions). People with mental disabilities continue to have more trouble being deemed otherwise qualified.

The role of the public school system in transitioning youth into better post-secondary and employment outcomes is increasingly important. It is mandated as part of special education programs for kids age 16, but it can start earlier. In addition, vocational rehabilitation regulation has shifted from sheltered, separated “charity” placements to competitive integrated employment. The preparation of youth with ASD to enter the competitive workforce is still relatively new and it requires unique solutions specific to the conditions from service staff that is familiar and trained in ASD. The quality of rehabilitation and transition services is crucial, but as pointed out this can really vary by provider and is generally inadequate, particularly for individuals with ASD. As autism awareness is growing one would expect this expertise gap to close, but it requires training and education of special education staff and vocational rehabilitation services staff.

Political and legal currents are intertwined with social and cultural currents. As autism awareness is moving from panicked epidemic to neurodiverse inclusion, this presents an opportunity to educate stakeholders in the legislature, the courts, and the public school system on the specific challenges individuals with autism face.

For example, the AbilityOne program and the WIOA of 2014 present opportunities to enforce affirmative action in hiring, awarding contracts to disability-owned businesses, and move away from Section 14(c) certificates to prioritize

competitive employment. Although stalled, the emerging push to move from subminimum wage payments has culminated in proposed legislation like the Transformation to Competitive Employment Act.

9.3 Economic Environment

With increasing prevalence and increased services, the societal costs continue to rise for people with ASD. There is no clear picture if families, the health system, or government carriers the brunt of these costs. Of the scarce economic cost studies, all of them pointed to lost productivity as a major factor in the societal costs.

Labor force participation and employment is a concern for people with disabilities and legislative efforts have not yet made the dent that was perhaps hoped in the 1990s with the passage of the ADA. Although there is no definitive number, compared to other disabilities, all signs point to people with ASD dealing with even higher numbers of unemployment and not participating in the workforce.

The growth of disability benefits claimants and the rising costs are of particular concern. More generous disability assistance, along with a declining demand for lower-skilled workers, increase the likelihood that unemployed workers exit the labor force through disability assistance (Autor & Duggan 2013). And disability benefits may keep people with disabilities out of the workforce. The risk of losing cash and medical benefits is too great a barrier. The Ticket to Work program has seen little impact although it is growing and recent years, perhaps with a tightening labor market, has seen more people leave disability benefits programs.

Small businesses are outpacing larger enterprises in job creation. And although they represent 99.5 percent of businesses out there, they only account for just over half of

the jobs. There is a risk associated with new businesses. Nearly a quarter doesn't survive the first year, and only one-third survive 10 years or longer (SBA Office of Advocacy 2017). As these businesses struggle to even survive, will they have the resources or the will to consider more inclusive hiring.

Vocational rehabilitation programs can be crucial in getting people to work. People with autism have been found to be among the most expensive disability groups to serve—perhaps due to lack of experience and education of the service providers—but they do have more success in finding employment after closing the VR case. However, people with ASD tend to then work far fewer hours and earn less in wages per week. This may be due to people with ASD being placed in low-skill employment opportunities. The VR services do have a positive return and people with ASD were found to earn more than 5x in wages for every dollar relinquished in benefits.

Although the case studies offer good insights and examples of the competitive advantages of hiring people with ASD, there is no body of research that looks at the economic benefits to companies. Companies like SAP report benefits like a higher retention rate (lowering costs), increased innovation (including patents and awards), and increased media impressions. In addition, the processes created to increase inclusive hiring and onboarding benefit nondisabled people as well: clearer communication and processes and a focus on job performance not soft skills.

Research by Crawford, Johnson, and Wingender studied the impact of ADA events on a publicly traded firm's value. The trio found that positive ADA-related media events increase a firm's value on the day of and the day following the event, while no evidence was found accruing to negative or neutral events (Crawford, Johnson, and

Wingender 2015). In other words, doing the “right” thing when it comes to disabilities is good for business, but there do not seem to be negative implications for not doing the right thing.

9.4 Social Environment

There are still myriad of concerns expressed by employers. Job performance is one such key concern and it also affects how nondisabled coworkers and supervisors accept people with disabilities. Case studies from SAP to Rising Tide help to frame employment of people with autism from a neurodiverse and competitive advantage perspective, rather than a deficit model. Indeed, most studies gauging attitudes toward employees with disabilities are framed from such deficit model.

However, as seen in studies that do highlight benefits and echoed by the case studies, there are many positives to hiring someone on the spectrum. One strategy is to build upon these strengths. More research can be directed to measure these benefits and create a holistic picture of a diverse workforce.

Autism awareness has increased exponentially in the last decade. Characters with autism are embraced in popular culture, contributing perhaps to both awareness as well as stereotypes, and the self-advocacy and neurodiversity movement has gained momentum. The neurodiversity perspective offers an important alternative to the deficit model of autism.

The increased awareness translates to the workplace as well. Although global attitudes towards disabilities are generally positive, there is still a more negative attitude toward specific questions on disability as well as a lack of hiring intention. And as we’ve

seen in other areas, people with psychiatric or mental disabilities, including autism, face stronger headwinds in terms of attitudes and stigma.

A recurring theme was the increase in positive perceptions and attitudes with more experience. This is grounded in the contact hypothesis as well, where intergroup contact can, under certain conditions, reduce prejudice and improve intergroup interactions. Vocational rehabilitation agencies would do well to increase their network to get more employers familiar with disabilities and autism in particular.

9.5 Technological Environment

Technology creates many benefits and new opportunities for people with disabilities in general and people with ASD in particular. The SAP case study finds that technology has changed the world for people with autism: from iPads to help in communication to noise-cancelling earbuds to regular sensory sensitivity to tech-enabled services like Uber to solve some transportation issues.

However, technology can also be a disruptive force. The skill-biased technological change hypothesis poses employment opportunities and wage gains go disproportionately to more high-skilled workers. People with ASD are being employed more in part-time, low-wage, low-skilled jobs. However, this may be changing with shifting perspectives and successes like the SAP Autism at Work program. Although care should be exercised not to stereotype or corner people with autism into a specific job, technology roles like software QA can be particularly suited to some of the traditional strengths of ASD.

Technology can help with an early start. An important section of the IDEA was to support and improve the use of technology, including universal design and assistive devices, to maximize accessibility and enhance learning of children with disabilities.

9.6 Lessons from the Case Studies

The highlighted case studies present some key lessons for more inclusive hiring. It starts with internal advocates. Interestingly, all programs and social enterprises described above were started by a parent of a child or young adult with ASD.

The framing of the opportunity is crucial. It has to be framed from an advantage mindset and not charity. For SAP diversity was a competitive advantage for innovation, for DXC and Rising Tide it was productivity and quality of work. And although none of the firms had brand and corporate responsibility benefits as the main goal, there is a positive effect on firm value for positive ADA coverage and inclusive hiring.

Local partners and ASD experts are important. Although the quality of vocational services may vary, recruiting from these services, from schools and nonprofits can yield a good pool of potential employees. These partners can also help in onboarding new recruits with ASD and training coworkers and supervisors.

Lastly, create an onboarding experience from recruiting to hiring to training and incorporation into the company. What are best practices for ASD can also be best practices for neurotypical. Possible goal is to have one process in the future for both.

10. DISCUSSION AND RECOMMENDATIONS

Recommendations to improve neurodiverse employment can perhaps be broken down into two main perspectives: (1) helping people with ASD work in and adapt to a neurotypical environment, and (2) assisting workplaces in adapting to or accommodating a neurodiverse workforce. A successful future for inclusive employment needs strategies from both perspectives that target specific needs and challenges that may alleviate the disabling factors of autism spectrum disorder. This is about tools for people with ASD to cope within a neurotypical environment. And then there are strategies to build a supportive environment. And this does not just mean accommodating, but rather adapting the workplace to a neurodiverse perspective.

Perhaps an analogy can illustrate the point. When mobile devices became more prevalent, designers increasingly faced challenges with a more diverse spectrum of screen sizes. A one-size-fits-all desktop approach towards designing applications and websites was no longer viable. At first, companies approached the problem from the perspective of accommodating mobile users with a separate mobile experience; there was a desktop site and there was a mobile site. Then, companies moved to responsive design—a technical foundation that adapts to any device regardless of screen size—with a mobile-first strategy that forced designers to really think through and break down the user experience from a new perspective.

It is by no means a stretch to apply this scenario to neurodiversity in the workplace. Today, a one-size-fits-all neurotypical approach towards the workplace and employment is no longer viable. The solution is also not found in just accommodations, but rather in broader and inclusive adaptations. With a neurodiversity-first strategy,

employers are forced to break down and evaluate how they build a workplace, write job descriptions, and hire employees. Adaptations like clearly defining essential and marginal job functions, increasing predictability, and removing distractions or stimuli from the workplace, can create a better work environment for all employees, not just those on the spectrum.

Based on the work of Microsoft, JPMorgan Chase, EY, and SAP on autism hiring initiatives—the latter of which is profiled above in a case study—Hala Annabi of the University of Washington led a team of authors to produce the Autism at Work Playbook. The report details the strategies and approaches of the four employers in creating and sustaining autism-ready workplaces.

Hendricks (2009) identified five major themes for vocational support: (1) placement, (2) supervisors and co-worker training, (3) on-the-job training, (4) workplace accommodations, and (5) and long-term support. With this thematic guidance, and the real-world strategies documented in the Autism at Work Playbook, the following section will wrap up the recommendations found in the environmental scan for each of the five areas of support. Hendricks concludes that a “careful match between the individual and the environment” is needed and when that is coupled with proper support, it can result in successful and ongoing employment.

10.1 Placement and Recruitment

“Nothing about us without us” is a phrase the disability rights movement and later in particular the Autistic Self Advocacy Network adopted. When designing a program for inclusive hiring, input from people with ASD and partners from the autism community is a prerequisite and assumptions should be avoided (Annabi et al. 2019).

Recruiting the right talent is a critical factor for any organization and particularly for companies looking to hire a neurodiverse workforce. This starts with ensuring the appropriate job match by focusing on individualized placement based on the person's strengths and interests (Hendricks 2009). Chen et. al (2014) summarize the major challenging factors: an employer's emphasis on established ways and a reluctance to involve third parties' support. In contrast, companies like SAP that have experience with recruitment of people with ASD find external partners and organizations in the local community including nonprofits and vocational rehabilitation services, as well as universities and colleges (Annabi et al. 2019).

Although the Rehabilitation Act emphasizes VR services and people with ASD can benefit from vocational interventions and services, there are major challenges remaining with the inadequacies of quantity and quality of services. People with ASD are more likely to be denied in the system than those with other disabilities, there is limited knowledge of ASD as a condition, providers rarely recognize unique needs, and the system overall is not prepared to meet the needs of a growing population of service seekers (Chen et al. 2014). Chen et al. encourage multidisciplinary collaboration in future research on strategies for successful employment. True collaboration, rather than mere co-existence of the different parties involved, like the Autism at Work program where private enterprise is synced with education and VR partners, as well as with families (Annabi et al. 2019).

Cohen (2019) suggests that diverse hiring starts with eliminating bias from the start: language within job descriptions can steer diverse candidates away. People with autism may look for characteristics like clearly defined job tasks and predictability in job

descriptions. On the other side of the coin, the firms in the Autism at Work playbook emphasize avoiding typical notions of what a resume should include (Annabi et al. 2019). As much as soft skills and social skills can be eliminated in earlier stages of the job seeking and application process with new technologies, the selection process inevitably includes an interview. Deficits in soft skills will be difficult to conceal in an interview setting and social skills are a significant predictor of employment outcomes. Moving away from traditional interview techniques to uncover relevant skills, inclusive companies emphasize practical skills over social skills. One New York-based software testing company knows that “a firm handshake and steady eye contact are no indicators of a candidate’s ability to root out bugs” (McLaren 2018). The case studies demonstrate several ways how companies can design a process: from SAP’s month-long onboarding with Lego robotics kits and partnerships with local organizations to the clear and structured test of Rising Tide with its forty-six step car wash process that needs to be successfully completed by the applicant. And despite the challenges with VR services, vocational support programs are in a position to teach individuals identifying appropriate jobs and preparing resumes (Hendricks 2009).

10.2 Supervisors and co-workers

Another key element the companies participating in the Autism at Work program have in common is training hiring managers and co-workers. This starts with awareness, setting clear expectations, and training managers and members of the hiring team on interview techniques suited to those with autism. Firms have reported carrying over best practices learned from this training to mainstream hiring (Annabi et al. 2019).

The social history of autism is still fraught with stigma and misconceptions today. While the self-advocacy and neurodiversity movement has gained momentum and this increased awareness has penetrated the workplace as well, there are still major challenges with employers' perceptions and attitudes. Despite global attitudes towards disabilities being generally positive, there is still a lack of understanding and negative attitudes toward specific employment questions and disability, as well as a lack of hiring intention. People with autism generally fair worse than those with other disabilities in terms of employment and people with psychiatric, developmental, or mental disabilities, including autism, face stronger headwinds in terms of attitudes and stigma. A recurring theme in the studies looking at employer attitudes was the increase in positive perceptions with more experience and exposure to people with autism in the workplace and beyond. This is perhaps grounded in the contact hypothesis, where intergroup contact can, under certain conditions, reduce prejudice and improve intergroup interactions (Allport 1954).

Beyond direct experience with individuals on the spectrum, there are specific organizational characteristics and cultural issues that make hiring managers more conducive to employing people with disabilities including diversity in other areas; a focus on capabilities rather than marginal functions; and having a positive view of vocational rehabilitation partners. And in light of the majority view in the courts that an employer can discipline or terminate an employee for workplace misconduct even when it is the result of a disability, and the numerous case law examples of ADA claims rooted in concepts such as "getting along with others" and "personality conflicts," fostering an understanding of autism and why people on the spectrum behave a certain way becomes a

crucial part of inclusive hiring. Not simply from a legal perspective, but from a workplace culture and human resource perspective as well.

In the Autism at Work program, the design of onboarding an employee with ASD is given particular attention as it relates to preparing the team. As echoed in Sarrett (2017), the program views the onus of change and inclusion as being with the firm, not the new employee. Similarly, the onus of change also lies with vocational rehabilitation agencies. Agencies need to increase their understanding of people with ASD and their specific needs and grow their networks to get more employers familiar with autism in particular. Furthermore, these service providers can help reframe deficit-thinking in regards to autism and translate unique features of people with autism into employment benefits to hiring managers, such as high concentration, concrete thinking, and attention to detail (Chen et al. 2014).

10.3 On-the-Job Training

Companies need to adequately prepare a candidate or new hire for the workplace. In the Autism at Work program, companies leverage existing mainstream processes and augment these with specialized training where needed (Annabi et al. 2019). To train individuals on the spectrum, more focus needs to go toward organization and soft skills including clear communication surrounding workplace rules, start time and end time, and even knowing how to get to and from work. The limited available research also supports teaching skills through strategies rooted in applied behavior analysis like modeling, structured rewards, and prompts (Hendricks 2009). Virtual reality-based training is increasingly common in mainstream employment. It has also been shown to be promising

in specific skill training, including social and emotional skills as well as interviewing skills, for individuals on the spectrum.

The question of specialized training versus mainstream training could perhaps be reframed with another question: are training programs geared to neurotypical learning patterns? In the Autism at Work Playbook, the authors suggest that managers who participate in autism awareness training become better managers for all employees (Annabi et al. 2019). This suggests that companies that switch to a neurodiverse-first approach (similar to the mobile-first analogy mentioned above) may create benefits for all employees regardless of neurological condition. The Autism at Work program offers no empirical evidence to date, nor has any study approached this topic, but it will be important to find to what degree neurotypical managers and employees can benefit from a neurodiverse-first training approach.

10.4 Workplace Accommodations

In the Autism at Work program, respect for privacy is stressed when it comes to accommodations. The authors caution the reader to communicate needs, not identity (Annabi et al. 2019). Although the Autism at Work program is specifically targeted to those on the spectrum, employees may not want to be identified as being a part of the program. Disclosing a disability is a difficult balancing act and not disclosing could create difficulties when seeking accommodations.

On a broad level, managers reported fewer concerns compared to previous decades, including the recognition that accommodations incur minimal costs for businesses (Ju, Roberts, and Zhang 2013), although smaller companies still had overall cost concerns in regards to hiring people with disabilities. Courts have defined reasonable

accommodations as making existing facilities readily accessible (specifically for people with ASD this can include noise levels, lighting, crowding) or solutions like job restructuring and modifying work schedules, utilizing equipment or devices, and providing training. Although courts have found that ADA protections are not intended to take away essential job functions, pro-active employers can write job descriptions from a neurodiverse perspective and focus on specific, task-oriented descriptions.

The Job Accommodation Network (JAN), a free service of the U.S. Department of Labor's Office of Disability Employment Policy, provides guidance on workplace accommodations and disability employment issues. Among its key recommendations for people with autism are process and management-related suggestions including providing concrete job performance examples, reinforcing and rewarding appropriate behavior, and more granular suggestions including providing written job instructions via email, allowing an employee to provide written response in lieu of verbal response, and developing clear expectations of responsibilities so an employee does not have to read between the lines (Job Accommodation Network n.d.). These accommodations target specifically challenges in social and communication skills.

In an extensive document, JAN provides further job accommodations that might be useful for employees with executive functioning deficits, which can be found in people with autism. The topics cover time management (e.g. providing a checklist or color-coded wall calendar); memory (e.g. allowing the use of a recording device or additional training time); concentration (e.g. providing noise-cancelling headphones to reduce auditory distractions or installing space enclosures to reduce visual distractions); and multi-tasking, organization and priorities, social skills, attendance, and getting to

work on time (Job Accommodation Network 2018). Recognizing that each employer is different and cases are judged on an individual basis, should it come to an ADA claim, the practical solutions offered by JAN cover a wide spectrum of accommodations that would rarely pose undue hardship for employers.

As autism is a spectrum, the degree of limitations and accommodations required will vary among individuals with ASD. Technology increasingly plays a role in providing accommodations: from visual supports, and augmentative and alternative communications, to noise-cancelling headphones. It is important that the process to determine accommodations is an interactive process in consultation with the employee on the spectrum. This is why non-disclosure makes finding proper accommodations harder for the employer.

10.5 Long-Term Support

The goal is that intensive support should slowly lessen over time, which can be facilitated with the appropriate circle of support. At SAP this means two support circles: workplace and personal. Hendricks (2009) calls this natural and external long-term support. As the job coach role, often provided by external agencies or vocational rehabilitation services, fades after a successful hire and onboarding, sustained and continual assistance are transferred to managers and company employees (Hendricks 2009). This natural, or on-the-job, support, requires defined roles for each member and the Autism at Work program lists roles beyond the immediate manager like an Autism at Work mentor, a team buddy, and an HR business partner. As programs mature, the roles change from support to improvement and sustainability (Annabi et al. 2019).

External, personal support requires strong partnerships. Day-to-day challenges in life outside of work could influence job performance and this includes transportation to work or personal and unexpected changes in social or medical matters (Hendricks 2009). In the case of Rising Tide, the social bonds built at work extend beyond the work day and into personal support as employees plan outings and even carpools.

People with disabilities may be presumed incompetent and their disability may lower expectations and inflate job performance ratings. The Autism at Work program emphasizes that program hires are expected to perform to the standards of the organization and should participate in mainstream performance reviews and retention activities. Employers view attributes such as dependability and consistent attendance or low absenteeism as positive for employees with disabilities. The retention rates of Autism at Work employees tend to exceed firm-wide retention rates (Annabi et al. 2019).

Changes in routines can be stressful for individuals with ASD. It was one of the major observations in even Kanner's earliest work on autism. In the workplace, changes in team membership, leadership, and organizational structure are common. The Autism at Work program emphasizes proactive and clear communication, creating a plan to manage the change, respecting an employee's privacy and disclosure preferences, and utilizing mentors and coaches to manage change (Annabi et al. 2019). These specific solutions to change management for employees on the spectrum may benefit the workforce as a whole.

10.6 Conclusions

Three overarching themes animate the above recommendations: (1) autism awareness efforts need to be more actionable, (2) a tripartite approach with employers,

the public sector, and people on the autism spectrum is needed, and (3) job and workplace design should start from a neurodiverse perspective.

Previous chapters described the momentum behind increased autism awareness. These efforts need to be more concrete and actionable. Courts need to better understand the disabling factors of autism, even where an individual may be perceived as high-functioning. In addition, managers need to understand how autism may affect a person's behavior in the workplace to minimize the risk of escalation or misconduct. And VR agencies need adequate training and resources to facilitate the growing and unique needs of people with ASD. Technology can further this momentum by providing affordable training.

Private enterprise and its managers, government entities like the public school system and vocational rehabilitation, and employees and applicants on the autism spectrum need to engage in what may be called a tripartite polder model of autism. The Dutch polder model of pragmatic consensus decision-making and cooperation between employers, labor, and the government, can serve as an example of policy-making where each party receives an equal voice. The efforts to move away from Section 14(c) subminimum wages is an example of this kind of cooperation on a Federal level. On a state or local level, there is an opportunity to group the private and public sector and leaders in the autism community to initiate broader collaboration.

And lastly, designing jobs, workplaces, and policies needs to start from an inclusive, neurodiverse perspective. This starts with removing bias from language in job descriptions, embracing a diverse workforce with flexible, personal management, and seeing external agencies as partners in the process. One of the objectives of the Autism at

Work program is to create processes that are universally applicable. There is anecdotal evidence that the training and education implemented through the program has benefited all employees.

10.7 Limitations

A limiting factor in scanning the business environment is that the relevant world is too complex to be completely summarized (Aguilar 1967). In assessing each of the PEST factors there were a wide range of topics to be covered. There was a definite paucity in available literature on autism specifically and many times a look at disabilities in general served as a proxy or substitute. When looking at disabilities in general, often times people with autism or developmental, mental and psychiatric disabilities, compared to other disabilities, were among those who fared worst in the findings or outcomes.

The lack of autism-specific literature was certainly a limitation. The breadth of topics covered also only allowed for a surface-level look. This is an environmental scan and not a deep dive into specific topics. This may have resulted in missing keyword searches in the research databases. Furthermore, the wide range of the autism spectrum as well as overlapping disorders and comorbidity may cause challenges in interpreting outcomes for individuals with autism spectrum disorder. It is difficult to generalize between people with autism diagnoses.

10.8 Future Research

The strategies covered here require further investigation. Although rooted in a research background, the majority of the specific recommendations have not been empirically examined. Some may have been demonstrated effective in populations with other disabilities or disabilities in general, but a specific focus on autism is required as

well. In addition, much of the research focuses on existing structures or past strategies. Society's understanding and perception of and reaction to autism and employment of people with autism is rapidly evolving. Large groups of people on the spectrum are outside the existing service system. Perhaps the most compelling topic for future research is what is outside these systems. The multidisciplinary collaboration between private companies like SAP and Microsoft in the Autism at Work program and the hundreds of small businesses that have found success and a competitive advantage by employing people with autism provide perhaps the most promising strategies. This is where empirical examinations are needed most.

Lastly, the definition of autism has undergone numerous changes since first reported by Kanner and Asperger in the 1940s. From a narrowly defined categorical view to an inclusive spectrum-based view, research has always followed the contemporaneous definitions. Recent research has highlighted the challenge of a heterogeneous population that is increasingly less different from the general population. The opportunity now, with autism defined as a spectrum and neurodiversity as a concept taking hold, is to frame future research in strength-based discourse, rather than a deficit model in search of a fix or cure. The challenge for research is to find meaningful subgroups of autism so that more specific and relevant models, questions, and strategies can be formulated and empirically examined.

APPENDIX SECTION

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Appendix A: Milestones in Disability Policy

Year	Milestone
Late 1800s	“Ugly Laws” across municipalities in the United States
1865	Columbia Institution for the Instruction of the Deaf and Dumb and the Blind
1920	Smith-Fess Vocational Rehabilitation Act (first broad-based federal program to provide vocational assistance to people whose disabilities were not the result of war)
1935	The Social Security Act (providing federal old age benefits and grants to the states for assistance to blind people and children with disabilities)
1938	Fair Labor Standards Act (FLSA) (Section 14(c) of the FLSA authorizes employers to pay subminimum wages)
1956	The Social Security Act 1956 Amendment (provide monthly benefits to permanently and totally disabled workers aged fifty to sixty-four in the Social Security Disability Insurance program)
1960	The Social Security Act 1960 Amendment (provide monthly benefits to permanently and totally disabled workers aged under fifty in the Social Security Disability Insurance program)
1964	The Civil Rights Act (although disability not a class, influence subsequent legislation)
1965	The Social Security Act 1965 Amendment (Medicare and Medicaid)
1972	The Social Security Act 1972 Amendment (Medicare for people with disabilities under age of sixty-five) (Supplemental Security Income) <i>Mills v. Board of Education</i> Children entitled to a free public education regardless of (severity of) disability
1973	The Rehabilitation Act of 1973 (Section 504)
1975	Education for All Handicapped Children Act (in 1990 reauthorized as IDEA)

1990	Americans with Disabilities Act
1996	Mental Health Parity Act (MHPA) (mental health benefits to be no lower than any such dollar limits for medical and surgical benefits)
1998	Workforce Investment Act (repealed and replaced with Workforce Innovation and Opportunity Act in 2014)
1999	<i>Olmstead v. L.C.</i> (under the Americans with Disabilities Act, individuals with mental disabilities have the right to live in the community rather than in institutions) (upholding the “integration mandate” of the ADA) <i>Sutton v. United Air Lines</i> (interpretation of ameliorating factors in disability) Ticket to Work and Work Incentives Improvement Act
2002	<i>Toyota Motor Manufacturing, Kentucky, Inc. v. Williams</i> (interpretation of “substantially limits major life activities”)
2006	Combating Autism Act (screening, education, early intervention, prompt referrals for treatment and services, and research)
2008	ADA Amendments Act (changes to the definition of the term "disability," clarifying and broadening that definition) Of particular significance, the EEOC in the wake of the Amendments stated that ASD is “virtually always be found to impose a substantial limitation” as a disability because it “substantially limits brain function.” Mental Health Parity and Addiction Equity Act (MHPAEA) (fill the loopholes left by the MHPA)
2014 & 2019	Autism CARES Act (reauthorize for five years existing federal autism research and assistance programs)

Appendix B: Milestones in the Social History of Autism

Year	Milestone
1896	Sigmund Freud coins the term “psychoanalysis.”
1910	Eugen Bleuler coins the term “autism” related to schizophrenia (a term he also coined), described as “autistic withdrawal of the patient to his fantasies, against which any influence from outside becomes an intolerable disturbance.”
1912	First International Eugenics Congress in London.
1921	American Eugenics Society formed after the Second International Conference on Eugenics in New York.
1926	Grunya Efimovna Sukhareva used the term “autistic (pathological avoidant) psychopathy” in a detailed description of autistic traits in children.
1938	Leo Kanner starts observing and chronicling the lives and behaviors of eleven of his child patients. Hans Asperger delivers a talk at the University Hospital of Vienna in which he describes “autistic psychopathy.”
1939	Nazi Germany officially adopts a state euthanasia program guided by the phrase "life unworthy of life."
1943	Kanner publishes his landmark paper <i>Autistic Disturbances of Affective Contact</i> where he describes infantile autism as independent from schizophrenia
1944	Asperger publishes a paper that includes the definition of “autistic psychopathy.” It remains obscured until translated in the 1980s.
1948	Kanner describes the parents of autistic children as cold perfectionists and the children themselves as having been “kept neatly in a refrigerator which didn't defrost” providing the impetus for the phrase “Refrigerator Mother” pushed by Bruno Bettelheim. Kanner later walks this back in 1969.
1952	DSM-I published. Autism appears in “Schizophrenic reaction, childhood type.”
1953	Dale Evans Rogers publishes her account of her daughter with Down’s Syndrome in <i>Angel Unaware</i> .

1962	British parents found the first autism organization now known as the National Autistic Society
1964	<p>Bernard Rimland publishes <i>Infantile Autism: The Syndrome and Its Implications for a Neural Theory of Behavior</i>, which counters the then-dominant psychogenesis refrigerator mother theories.</p> <p>Ivar Lovaas begins experiments in Applied Behavioral Analysis at UCLA, with intensive interventions (including electroshock) based on B.F. Skinner’s concept of operant conditioning.</p>
1965	National Society for Autistic Children founded in the United States by folks including Bernard Rimland, Ruth Sullivan, and Ivar Lovaas. Now known as the Autism Society of America.
1967	<p>Autism is classified under schizophrenia in the International Statistical Classification of Diseases and Related Health Problems.</p> <p>Bruno Bettelheim publishes <i>The Empty Fortress: Infantile Autism and the Birth of the Self</i>, doubling down on psychogenesis and blaming mothers.</p> <p>Clara Claiborne Park publishes <i>The Siege: The First Eight Years of an Autistic Child</i>, one of the first parent memoirs about autism.</p>
1968	DSM-II published. “Autistic, atypical, and withdrawn behavior” still appears in “Schizophrenic reaction, childhood type” and notes that “failure to develop identity separate from the mother’s” as well as “developmental defects may results in mental retardation.”
1971	The United Nations adopts the Declaration of the Rights of Mentally Retarded Persons to respect the dignity of the mentally disabled.
1972	Wolf Wolfensberger publishes <i>The Principle of Normalization In Human Services</i> , popularizing the Scandinavian concept of normalization and integration for people with disabilities in the United States and marking the end of institutionalization and providing a basis for the neurodiversity concept a few decades later.
1976	English Psychiatrist Lorna Wing coins the term Asperger’s Syndrome.
1980	DSM-III published. Establishes “infantile autism” as an independent diagnosis and distinct from schizophrenia.
1981	Lorna Wing publishes Asperger syndrome: a clinical account and popularizes the term in the English-speaking medical world. Autism is viewed as a spectrum.

1983	Mike Oliver publishes <i>Social Work with Disabled People</i> and introduces the social model of disability, which poses that not impairments but disabling barriers faced in society.
1985	Simon Baron-Cohen, Alan M. Leslie, and Uta Frith publish <i>Does the autistic child have a “theory of mind”?</i> , which proposes that people with autism have difficulties understanding other people's beliefs.
1986	Temple Grandin publishes <i>Emergence: Labeled Autistic</i> .
1987	DSM-III-R published. Added pervasive developmental disorder-not otherwise specified (PDD-NOS) and broadened the criteria for diagnosis. Lovaas publishes <i>Behavioral Treatment and Normal Educational and Intellectual Functioning in Young Autistic Children</i> , used widely in support of ABA therapy.
1988	<i>Rain Man</i> is released in theaters around the world.
1991	Uta Frith translates Asperger’s original 1944 research in English
1993	Jim Sinclair delivers a speech “Don’t Mourn for Us” providing the breeding ground for self-advocacy movement.
1994	DSM-IV published. Asperger’s Syndrome included as its own diagnosis.
1995	Defeat Autism Now! And Cure Autism Now founded, focused on finding “cures.”
1996	Judy Singer coins the term neurodiversity in her dissertation.
1998	Andrew Wakefield’s damaging and fraudulent paper on MMR vaccines and autism is published in <i>The Lancet</i> .
2005	Autism Speaks is founded. The epidemic narrative is boosted. Cure Autism Now merges with Autism Speaks a year later. Autism Speaks drops the word “cure” from its mission statement in 2016.
2006	Autistic Self Advocacy Network is founded.
2007	New York University Child Study Center launches its controversial “Ransom Note” campaign. Self-advocate Ari Ne’eman and his Autistic Self Advocacy Network gain prominence by pushing back.
2010	<i>The Lancet</i> formally retracts Wakefield’s article and Wakefield is stripped of his medical license.
2013	DSM-5 published. Asperger’s Syndrome and PDD-NOS rolled into Autism Spectrum Disorder.

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