

Historical perspectives on neurodevelopmental disorders: The merging of *us* and *them*

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ABSTRACT Attitudes towards neurodevelopmental disorders (NDDs) have transformed and fluctuated throughout history, often reflecting the societal culture of the time. Although individuals with NDDs are presently more valued than they have ever been, there are historic and current perspectives and events which have propelled the study of NDDs in both positive and negative directions. The notion of disability originated in Antiquity, where infants with “physical deformities” were deemed unworthy of societal membership. Despite later community inclusion in the Middle Ages, disability was perceived to result from demonic possession or punishment. Subsequently, individuals with NDDs were placed in institutions designed for physical and social isolation. The Enlightenment marked the first positive shift in attitudes and treatment towards those with disabilities, as proponents advocated for the removal of inhumane institutional conditions. The humane movement, moreover, contrasted the long-held belief that individuals with disabilities were “inferior” and “dumb” by illustrating that children with NDDs were capable of learning and worthy of education. The Industrial Revolution reversed these progressive ideas by associating disability with inefficiency. Further, during World War II (WWII), the eugenics movement propagated the belief that NDDs blemished a strong nation, which inculcated widespread support for the forced sterilization and mass murder of individuals with NDDs. Global legislation was instated post-war to protect the rights of those with NDDs. These progressive ideas, originating from the humane movement, fostered the many educational methodologies and opportunities now available for children with NDDs. Though current perspectives towards NDDs have vastly improved, there is greater confusion regarding the moral implications of advancing research in biotechnology for genetic engineering and testing. While benefits exist, there is a potential for the emergence of a modern eugenics movement in the 21st century. The obscurity of this dilemma poses serious moral questions that must be considered within the historical context of perspectives on NDDs.

INTRODUCTION

Neurodevelopmental disorders (NDDs) have been portrayed in various ways throughout history. The American Psychiatric Association ([APA], 2013) published the prevailing view in the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; DSM-5), which describes NDDs as an umbrella term for disorders that have an onset in early development and are characterized by impaired personal, social, academic, or occupational functioning. Each NDD has a varying functional impact ranging from mild to severe (APA, 2013). The prevalence of NDDs has increased in the United States (US) from 12.84% in 1999 to ~17% in 2017 (Zablotsky et al., 2019). The latter figure represents approximately one in six children, aged three to 17, diagnosed with at least one NDD (Zablotsky et al., 2019). One possibility for rising diagnostic rates may be a greater awareness of the diagnostic characteristics of NDDs. This increasing awareness may have encouraged heightened acceptance of NDDs in the 21st century, as evidenced by greater societal inclusion and accommodation. Unfortunately, advancements in behavioural genetics may unintentionally diminish the human value of those with disabilities by suggesting that some genes are superior. In pursuit of advancing certain biotechnologies, scientists should caution against restoring negative societal conceptions of disability. Although individuals with NDDs are more valued than they have ever been in society, there are both historic and current events which have

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propelled the study of NDDs in both positive and negative directions.

HISTORICAL REVIEW

The concept of disability was introduced in Ancient Greece. However, when examining past accounts of disability, it is important to consider varying conceptualizations throughout history. Past descriptions of disability were broader than current understanding. The term “mental retardation” (currently labelled intellectual disability [ID]) originated in the Therapeutic Papyrus of Thebes in 1552 B.C.E. (Ollendick & Hersen, 1998). The obscure writings described treatments for disabilities of the mind and body resulting from brain damage (Ollendick & Hersen, 1998). The introduction of disability resulted in the establishment of negative attitudes towards those with disabilities. The Age of Antiquity was a tragic period for children born “physically deformed” as infanticide was commonly directed towards infants with congenital disabilities (Patterson, 1985; Schuelka, 2013). Exposure, the most frequent form of infanticide, occurred when infants were abandoned in the wilderness, dying soon after (Patterson, 1985). This was documented in Aristotle’s *Politics*: “As to the exposure and rearing of children, let there be a law that no deformed child should live” (Larson, 2014). In Sparta, Greece’s military city, the elders decided whether an infant should live (Arthur, 2020). The criterion was simple: if a child was deemed unfit to fight, that child was unfit to live (Arthur, 2020). From the onset, infants with disabilities were viewed as “inferior”, “weak”, “burdensome”, and “undeserving of societal membership”.

During the 5th century, Christian laws prohibited exposure and infanticide as these acts were discordant with religious beliefs regarding the sanctity of life (Gushee, 2013; Mustakallio & Laes, 2011). Rather, two themes prevailed in describing disability: disability as possession and disability as punishment (Mustakallio & Laes, 2011). Children with disabilities who experienced various symptoms (e.g., panic attacks or muteness) were perceived to be possessed by demons (Mustakallio & Laes, 2011). Moreover, disability was viewed as a punishment for a person’s sin (Mustakallio & Laes, 2011). However, treatment towards disability in the Middle Ages was mixed: families or the Church usually cared for children with disabilities as it was deemed a Christian duty (Mustakallio & Laes, 2011). However, sometimes these children resorted to begging due to the economic burden they caused their families (Mustakallio & Laes, 2011). Although individuals with disabilities were judged quite negatively, they were permitted to live in medieval society.

The Enlightenment of the 18th century promoted reason, progress, and the scientific method (Brown & Radford, 2015). This cultural climate facilitated the work of French physician Philippe Pinel in establishing the moral treatment movement, which argued for the end of harsh treatment towards individuals with disabilities living in asylums/institutions in favour of more humane and compassionate models of care (Brown & Radford, 2015). The moral treatment movement coincided with humanitarianism (i.e., the commitment to improving the lives of everyone in society, especially those who required the most support [Brown & Radford, 2015]), and together they arguably propelled the conceptualization and treatment of individuals with NDDs. Pinel improved treatment towards the “mentally ill” in the Bicêtre asylum by removing physical restraints, prohibiting physical abuse, and encouraging

empathetic communication with patients (Trent, n.d.). Moreover, Pinel replaced the view that disability was caused by demonic possession with the notion that social stress, hereditary conditions, and physiological impairments were the actual cause of symptoms (“Philippe Pinel”, 2001).

The moral treatment and humanitarian movements also promoted improvements in education for individuals with disabilities. Jean Marc Gaspard Itard is eminent for his work in the early 1800s with Victor of Aveyron, the “feral child”, who lived isolated in the woods until he was approximately 12 (Brown & Radford, 2015). Without human exposure, Victor never developed language, nor knowledge of societal norms (Brown & Radford, 2015). Many physicians deemed Victor an “incurable idiot” (Ferguson, 2006); however, Itard was devoted to teaching Victor language and social skills. Itard was the first person to attempt special education on a child with an ID (Ferguson, 2006). This work was highly progressive for its time, though most professionals viewed Victor’s training as a futile pursuit. Itard’s work inspired his student, Edouard Séguin, to continue working with individuals with IDs: in 1839, Séguin opened the first school for children with severe IDs (“Edouard Séguin”, 2020). Séguin further developed a sensory training method as he believed that IDs were caused by a fragility of the nervous system (“Edouard Séguin”, 2020). Itard and Séguin’s commitment to educating children with IDs propelled the study of NDDs by emphasizing that individuals with disabilities are not only worthy of education but also capable of learning.

Humanitarianism began to wane towards the end of the 19th century with the rise of industrialization, which transformed agricultural-based economies to manufacturing-based ones (Larkin, 2011). Society represented a giant efficient machine (Larkin, 2011). Individuals with disabilities were unsuited for urban life, as they were perceived as “inefficient” in meeting factory production demands (Larkin, 2011). Consequently, those with disabilities were dismissed and placed in asylums to become “a productive cog in the greater societal machine” (Brown & Radford, 2015, p. 8). Asylums originally emphasized education and development prior to industrialization but abandoned this focus to reflect society’s new beliefs on disability (Brown & Radford, 2015). Disability transformed within this cultural context by pathologizing both intellectual and physical impairments (Roeher Institute, 1996). Advances in biomedicine also assisted in the emergence of the dominant medical model of disability, which believed impairment was rooted in the body and therefore required medical treatment (Roeher Institute, 1996). Once again, although the perceived causes of disability changed from divine to physiological ones, people with NDDs were still disconnected from society, thereby perpetuating the distinction between us and them.

Attitudes towards disability worsened at the end of the 19th century with the advent of eugenics. Francis Galton was inspired by Charles Darwin’s theory of evolution via natural selection and was especially intrigued by Darwin’s chapter on selective breeding of animals and the implications this could have on humans (Gillham, 2001). In 1883, Galton coined the term eugenics, originating from the Greek word *eugenes* (“good birth”), to describe his goal of improving the human gene pool through selective breeding (Gillham, 2001). The notion that human abilities are hereditary was the premise of Galton’s theory (Gillham, 2001). The eugenics movement progressed in two directions – positive eugenics and negative eugenics (Grodin et al., 2018). Galton advocated for

positive eugenics, which promoted the reproduction of desirable traits (e.g., encouraging highly able individuals to produce more offspring than those “less able”; Brown & Radford, 2015; Grodin et al., 2018). Conversely, negative eugenics favoured restricting the reproduction of negative traits (e.g., via sterilization; Grodin et al., 2018). The eugenics movement gained widespread popularity as countries desired strong and progressive populations (Brown & Radford, 2015; Grodin et al., 2018). Henry Goddard was one such advocate of eugenics, in the early 20th century, aspiring to prevent the breeding of more “feeble-minded” (those with IDs; Grossberg, 2011). Goddard translated Alfred Binet’s intelligence test to study “feeble-minded” children in the US (Green, 2019). Goddard introduced three terms to describe lower degrees of mental development: “moron” (IQ = 51-70), “imbecile” (IQ = 26-50), and “idiot” (IQ = 0-25; Green, 2019). Goddard assisted in the screening of immigrants for an intelligence testing program on Ellis Island, as there was a law banning the entry of immigrants deemed “feeble-minded” (Green, 2019). Goddard used the Binet test and his classification system to determine individuals’ degree of mental development to separate the “feeble-minded” from American society.

The eugenics movement is arguably one of the most detrimental events to occur in the history of NDDs. This is evidenced by Nazi Germany’s adoption of negative eugenics. Adolf Hitler aimed to create an Aryan master race by sterilizing those with any disease or disability to prevent the reproduction of inferior genes (Grodin et al., 2018). However, as the war progressed, euthanasia (“good death”) replaced sterilization (Hudson, 2011). Euthanasia supposedly describes “mercy killings” (i.e., assisted dying for those who are terminally ill and suffering). However, under the Nazi regime it was a euphemism for murder (Grodin et al., 2018). The first systematic euthanasia program in the Holocaust targeted children with disabilities (Hudson, 2011). Doctors were compelled to report infants born with an illness or children up to the age of three with an existing illness (Hudson, 2011). These children were murdered in clinics and their parents would then receive letters indicating that they died from natural causes (Hudson, 2011). The criteria for children with disabilities later expanded to include children up to 17 and those with less severe disabilities (United States Holocaust Memorial Museum, 2020). Approximately 5000 to 8000 children were murdered under this euthanasia program (Hudson, 2011). In 1939, the Nazis expanded their program to include adults (Grodin et al., 2018). Aktion T4 was the sterilization program that used poisonous gas to mass murder people with disabilities (Berenbaum, 2020). By the end of the Holocaust, approximately 275,000 victims with disabilities labelled “unfit” for German life were murdered (Berenbaum, 2020). After WWII and the fall of Nazi Germany, the eugenics program lost considerable momentum as countries wanted to distance themselves from anything associated with the Nazis. The eugenics movement significantly halted progress in improving attitudes towards and enhancing the lives of individuals with disabilities.

CURRENT PERSPECTIVES

Prior to WWII, state sovereignty was the dominant governing approach. However, the monstrosities of WWII and the Holocaust accentuated the need for international regulations to protect citizens from their countries’ unrestricted state sovereignty (Kanter, 2015). Although international human rights became a topic of chief importance, people with disabilities remained relatively invisible

(Kanter, 2015). However, attitudes towards NDDs in the 21st century significantly improved with the increasing demand for further international protection for people with disabilities by individual advocates and organizations (Kanter, 2015). In 2006, the United Nations (UN) adopted the Convention on the Rights of Persons with Disabilities (CRPD), which was the first human rights treaty concerning people with disabilities (Series, 2015). Due to the all-encompassing nature of this legal document, this treaty included, but was not limited to, individuals with NDDs (Kanter, 2015). The CRPD contains 50 articles outlining inclusion principles for people with disabilities, such as the right to accommodation, accessible environments, and inclusive education (Series, 2015). This convention was revolutionary for enhancing the prominence of disability in global legislation (Kanter, 2015). The acknowledgment that individuals with disabilities should be included, as well as given equal status in the community, is not only a recently established movement within disability history, but also brings individuals one step closer towards merging societal attitudes of us with them.

Since the establishment of the CRPD, inclusive education is one remarkable area of growth for children with NDDs. Inclusion in educational settings refers to the integration of both children with and without NDDs in a regular classroom (Lamport et al., 2012). “Co-teaching” commonly occurs in inclusive classrooms where a general teacher and special education teacher both provide instruction in order to adapt to students’ educational needs (Lamport et al., 2012). When inclusive classrooms are implemented as recommended, both children with and without disabilities benefit. For example, research demonstrates that inclusive classrooms enable children with disabilities to develop basic communication and motor skills from the prompts and cues provided by other classmates (Hunt, Staub, et al., 1994). Moreover, studies reveal that inclusive classrooms enhance engagement on the part of students with disabilities (Hunt, Farron-Davis, et al., 1994; Mirenda & Katz, 2002). Prolonged engagement most likely occurs as a child with an NDD is commonly accompanied by a typically developing peer (Hunt, Farron-Davis et al., 1994). Although a common complaint is that typically developing children will receive less attention and thus be unable to fulfill their academic potential, studies indicate no academic disadvantages for any student and that all children profit socially (Salend & Garrick Duhaney, 1999). Including students with disabilities in regular classrooms may also shed light on pedagogical issues. Chandler-Olcott and Kluth (2009) provide a scenario where a teacher in an integrated classroom explains a comprehension activity. The researchers propose a situation where most of the students in the classroom misunderstand the activity yet attempt to complete it regardless. A child with autism spectrum disorder, however, may brusquely shout that the activity is useless. The researchers explain that this so-called “challenging behaviour” (i.e., abruptly calling out) can actually expose common problems that everyone in the class experiences, thereby enhancing the likelihood of elucidating confusion and improving learning outcomes. There are various social and behavioural advantages which accompany inclusive classrooms for all children. Although challenges still emerge, the development and improvement of inclusive classrooms continue. It is important to consider the origins of this ongoing and gradual positive shift in attitudes and treatment towards people with NDDs. These changes began with bright-minded individuals who, despite their dissenting opinions, believed that children with disabilities were capable of learning. The early proponents of

humanitarianism, Itard and Séguin, contributed to the development of inclusive classrooms by pioneering education for children with NDDs.

Although attitudes and treatment towards those with NDDs have improved, some still equate disability with suffering (Reinders et al., 2019). This representation of disability as a “pitiful condition” appears recurrently within NDD discourses (Reinders et al., 2019). In turn, some people’s perception of disability regresses to reflect periods in history where disability was viewed as a “life not worth living”. Critics have argued that society created a “new” eugenics in the 21st century due to the popularity of behavioural genetics (Reinders et al., 2019; Rembis, 2009). Behavioural genetics examines the influence of genes on behaviour, dispositions, and mental traits (Rembis, 2009). Preimplantation genetic diagnosis, prenatal genetic screening, and prenatal genetic diagnosis are three methods, associated with behavioural genetics, which examine the genetic makeup of a fetus (Grodin et al., 2018). These methods assess either the risk or presence of a genetic condition in the embryo or foetus, and produce test results that assist in pregnancy decisions (i.e., whether to have an abortion; Reinders et al., 2019). For instance, the Icelandic government requires physicians to inform pregnant mothers about available screening tests. This legislation likely contributes to Iceland approaching a down syndrome (DS)-free society with approximately only two to three children born with DS yearly (Reinders et al., 2019). It is quite striking that almost 100% of Icelandic women who have a positive test result for DS choose to abort their pregnancies. Although theoretically parents possess “free choice” in pregnancy decisions, these choices are often influenced by systematic bias (Rembis, 2009). Quality of life (QoL) for the child is a main consideration in making these decisions (Reinders et al., 2019). However, physicians and other healthcare professionals often view QoL in a medical context, equating NDD with suffering (Reinders et al., 2019). Contrastingly, in a support-services context, QoL consists of broader domains, including relationships, inclusion, and rights (Reinders et al., 2019). “Designer babies” are another recent concern for opponents of behavioural genetics, as advancing biotechnology opens the possibility of selecting a child’s genetic makeup prior to implantation (Grodin et al., 2018). This practice merits careful consideration as it may result in some genetic traits being viewed as superior, which has serious implications for the eradication of certain traits (Grodin et al., 2018). Specifically, NDDs may be viewed by society as “undesirable,” thereby potentially resulting in reduced mental wellbeing for those already living with an NDD.

In making prenatal decisions, the narratives of individuals with NDDs and their families are often missing from discussions with healthcare professionals. A recent study of 294 individuals living with DS in the US revealed that approximately 99% of respondents disclosed that they were happy with their lives, satisfied with who they are, content with their appearance, and loved their families (Reinders et al., 2019). Moreover, parents of children with NDDs have reported that factual information is scarce when expectant parents receive their test results (Reinders et al., 2019). Although there is no correct decision on whether to bring a child into the world, they should be presented with balanced information before choosing. In considering the evolving progression of behavioural genetics, scientists should remember the detrimental impact of eugenics on individuals with disabilities. Although behavioural genetics should not be equated to the Nazis’ euthanasia program,

the latter should remind society that “small steps along a slippery slope can lead to crimes against humanity” (Grodin et al., 2018, p. 55). The Nazis did not immediately begin murdering individuals with disabilities; this only occurred gradually after repeated propagation of their ideology that disability weakened German society (Grodin et al., 2018). Thus, continued research in behavioural genetics warrants caution as these practices may, at some point, breach moral boundaries.

CONCLUSION

Individuals with disabilities were historically perceived as “weak”, “burdensome”, “demonic and sinful”, and “medically impaired”. Current representations view those with disabilities as valued members of society. Moral treatment and humanitarianism were critical movements in gradually attaining equal rights for individuals with NDDs, especially where education is concerned. However, notions of eugenics remain present in biotechnological advancements. The goal of eugenics is to improve the human gene pool by either restricting or encouraging the reproduction of specific genes. This core eugenic principle must not be forgotten when continuing to pursue scientific research. Although attitudes and treatment towards individuals with NDDs have significantly improved, people should continue to fight for the rights of those who need greater and individualized support, while remaining cautious of scientific advancements in the field of behavioural genetics.

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