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Cyborgs and The Americans With Disabilities Act

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CYBORGS AND THE AMERICANS WITH DISABILITIES ACT

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INTRODUCTION

The definition of “*Cyborg*” is a hotly debated definition ranging from:

“A person whose abilities are extended beyond normal human limitations by mechanical elements built into the body,” (Definitions Oxford Languages) to “A bionic human” (Merriam- Webster).

Once the strict domain of Sci-Fi writers, dreamers, and those with strong imaginations the term Cyborg is gaining traction, membership, and recognition. As pointed out in the popular online *Lawfare* blog,¹ the Supreme Court stated in a recent criminal case that “modern cell phones, which are now such a pervasive and insistent part of daily life that the proverbial visitor from Mars might conclude they were an important feature of human anatomy.”² Interestingly, the writers point out that if the Supreme Courts contention were to be widely applied, the majority of Americans who use a smartphone, would qualify for Cyborg status.³ It was even gleefully noted in a similar thinking law review article that Arnold Schwarzenegger who starred as the Terminator, in the popular movie about a Cyborg with a vendetta, is now arguably a Cyborg in reality having newly implanted metal hip technology within his body.⁴ Neil Harbisson of Spain, is called by the media as the worlds’ first Cyborg according the *Guinness Book of World Records*. This is because he is implanted with an antenna like attachment into his skull that allows him to see color (he was once

¹ Benjamin Wittes & Jane Chong, *Cyborgs! Law and Policy Implications* LAWFARE CYBER AND TECHNOLOGY (Sept. 5, 2015, 10:27 AM), [Cyborgs! Law and Policy Implications- Lawfare \(lawfareblog.com\)](http://www.lawfareblog.com).

² *Riley v. California*, 573 U.S. 373, 385, 134 S. Ct. 2473, 2484 (2014).

³ Wittes & Chong, *supra* note 1.

⁴ Collin R. Bockman, *Cybernetic-Enhancement Technology and the Future of Disability Law*, 95 Iowa L. Rev. 1315, (2010).

colorblind). Whether, this is an accurate title or not, it remains a fact that millions of humans have metal, electronic devices or other medical devices implanted within them to help their health and living.

If you don't believe that Cyborgs are worthy of legal discussion, consider that this very article is being written by a person who considers themselves a proud Cyborg. Yes, I, the author, currently, have a Melody Valve within the chambers of my heart. The Melody Valve is created by Medtronic of Minnesota and consists of the jugular vein of a cow that is sewn into a metal frame. My life is at this very moment being preserved by a hybrid animal metallic bit of machinery in my chest area. I have had four other valves throughout my Cyborg life, ranging from ones consisting of porcine tissue to those of more metallic manufacture. The valves keep getting better and the surgeries somewhat easier since the mid 1990's. I am a proud Cyborg and see no negativity attached to that term. I foresee that Cyborgs more advanced than me will be the way of the future.

I had my fifth open heart surgery in 2018 at the Mayo Clinic in Rochester, Minnesota. My Mayo clinic surgeons were able to perform what I consider to be a medical miracle and installed within me an artificial heart valve much larger than my prior valve, allowing for better blood flow. Where there once was a single one-way dirt road, there is now a super highway with multiple-lanes. After my surgery I remember with glee, being newly able to run distances that were prior unimaginable to me. It was at that moment, of technological assisted achievement, that I realized that medical technology was capable of amazing and profound things. I was proud to be at the tip of the medical, legal, and technological spear. I have been told that my next surgery (hopefully decades from now) may be able to be done by

robots or at the very least remote-controlled equipment involving less-invasive procedures, rather than a full-length chest incision (a miracle in and of itself).

By all accounts medical technology is progressing at lightning speed. Service robots, exoskeletons, autonomous vehicles, audio synthesizers, artificial organs, and artificial limbs are being used with greater frequency around the world; in sync with the usage of smartphones, computers, assistive vehicles, iPhones, and devices such as Siri to enhance humans' lives.⁵ Once the domain of computers, we now have access to almost infinite knowledge and programs via these new gadgets. In a snowball effect, better technology continues to spawn newer technology at ever increasing rates and yields.⁶ It is apparent that the institution of law so bound by the precedent of the past needs to start looking forward. The Americans with Disabilities Act (ADA) needs to consider the medical future and the new class of person deemed Cyborg. It is also apparent that judges with little scientific or medical training are ill equipped for this coming medical technological storm.

PURPOSE

The purpose of this paper is to examine the intersection of emerging assistive technologies, creation of Cyborgs and the effect this will likely have on the ADA and the Assistive Technology Act. Specifically, this paper will seek to examine the effect that emerging assistive technologies will have on what is qualified as a reasonable accommodation. This specific intersection was chosen because what qualifies as a reasonable

⁵ Laurie Schaller, *The ADA: Paving The Way For Assistive Technology*, National Disability Institute, 2021, <https://www.nationaldisabilityinstitute.org/blog/the-ada-paving-the-way-for-assistive-technology/>.

⁶ Collin R. Bockman, *supra* note 4, at 1329-1330.

accommodation will likely expand due to the gap that is being filled by assistive technologies.⁷ I hypothesize that the scope and breadth of what is a reasonable accommodation will need to be expanded by the Supreme Court in order to keep pace with the lightning fast advance of medical technologies. Cyborgs as a class will expand in both capability, and options. Without prior thought by the Supreme Court our legal system will simply not be able to keep up. Picture a disabled employee, who can now work due to a robotic or semi-robotic limb, or say a deaf employee now equipped with hearing aids with Bluetooth technology, making them more proficient at their jobs and happier with life in general. The future has exciting opportunities for the law and its approaches to the ADA and accommodations.

THE ASSISTIVE TECHNOLOGY ACT

The Assistive Technology Act defines assistive technology as: “any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities.” (29 U.S.C. Sec 2202(2)). The Act was passed with the purpose of providing tech related services to people with disabilities and to increase awareness about such services.⁸ The law was restructured in 2004 to make it a formula-based grant program, which means that federal funding is contingent upon performance under this formula. *Id.* Assistive technology (AT) programs, which receive this funding in each state then assist in exploring and offering

⁷ David J. Garraux, *From The Jetsons to Reality, or Almost: What Employers Need to Know About Robots and AI in the Workplace* K&L GATES HUB, Sept. 16, 2019, <https://www.klgates.com/From-The-Jetsons-to-Reality-Or-Almost-What-Employers-Need-to-Know-About-Robots-and-AI-in-the-Workplace-09-16-2019>.

⁸ Center for Parent Information and Resources, *Assistive Technology Act*, March 2021, https://www.parentcenterhub.org/wp-content/uploads/repo_items/cpir-on-ata.pdf (last visited July 19, 2022).

Assistive Technology to those in need.⁹ Clearly, new technology which can assist humans will also be implicated under this act as well as the ADA. As technology expands, so to, AT programs will need to update what they offer and confer with medical professionals about the latest innovations and products.

THE ADA

On a warm day in July of 1990 this groundbreaking legislation was signed into law. During the ceremony for this legislation President George Bush (Senior) stated “let the shameful walls of exclusion come down”. The general thrust of the ADA is to provide equal opportunities for those with disabilities in employment and a few other areas.¹⁰ It has been hailed as one of the Nation’s most comprehensive civil rights legislation pieces.¹¹

The act is divided into four sections called titles:

- 1) “Employment.”
- 2) “State and Local Governments/Transportation/Public Services.”
- 3) “Public Accommodations.”
- 4) “Telecommunications.” *Id.*

Title I of the Americans with Disabilities Act of 1990 (the "ADA") requires an

⁹ National Assistive Technology Act Technical Assistance and Training Center, *AT Act Information*, <https://at3center.net/at-act-information/> (last visited Mar 11, 2022).

¹⁰ FISA Foundation, *A Summary of the Americans with Disabilities Act (ADA) of 1990*, FISAFOUNDATION.ORG, <https://fisafoundation.org/ada-25/a-summary-of-the-americans-with-disabilities-act-of-1990/> (last visited Mar 10, 2022).

¹¹ United States Department of Justice Civil Rights Division, *Introduction to the ADA*, ADA.GOV, https://www.ada.gov/ada_intro.htm (last visited Mar 10, 2022).

employer to provide reasonable accommodations to qualified individuals with disabilities who are employees or applicants for employment, unless to do so would cause undue hardship.”¹²

According to FISA there are three specific individual categories for reasonable accommodations to occur:

- 1) “modifications or adjustments to a job application process that enable a qualified applicant with a disability to be considered for the position such qualified applicant desires; or.”
- 2) “modifications or adjustments to the work environment, or to the manner or circumstances under which the position held or desired is customarily performed, that enable a qualified individual with a disability to perform the essential functions of that position; or.”
- 3) “modifications or adjustments that enable a covered entity's employee with a disability to enjoy equal benefits and privileges of employment as are enjoyed by its other similarly situated employees without disabilities.” *Id.*

Prong two is especially relevant for the intersectionality of “Cyborgs” and the ADA. However, all prongs may be implicated due to future implanted medical technologies. Prong two is striking because technologies will intersect with the work environment and allow those with coverage under the ADA to bring new technology in as adjustments or modifications to the workplace, and therefore allow them to potentially succeed under an ADA claim. This is where the rapid advances with medical technology could potentially outpace the law and

¹² FISA Foundation, *supra* note 10.

create issues for the court. Imagine a plaintiff with a built-in microprocessor in their brain that allows them to handle PTSD episodes. This processor requires an employee to sometimes ignore audio sounds for brief periods. Imagine this hypothetical plaintiff is a telemarketer or dispatcher, I would suspect our courts to be woefully untrained in the use of applying science to novel ADA issues that may yet arise, like this one. Further, imagine someone who may need to bring a robot or robotic limb with them to work in order to succeed as a factory worker. I further suspect that employers and employees alike would be ill prepared to react comfortably to this technology if this is determined to be a reasonable accommodation. Will courts say these are reasonable accommodation's or will they be too intimidated by their novelty? Further, how will our current courts handle such novel technical issues under an ADA framework without forethought?

REASONABLE ACCOMODATIONS

The ADA intersects with three areas of employment¹³:

- 1) “ensuring equal opportunity in the application process.”
- 2) “enabling a qualified individual with a disability to perform the essential functions of a job.”
- 3) “making it possible for an employee with a disability to enjoy equal benefits and privileges of employment.” *Id.*

The ADA does not impose any technological type limitations on the type of accommodation that can be requested. Accommodations can be hi-tech or low-tech and still receive the same protection under the ADA. The EEOC has indicated that accommodation

¹³ US Department of Labor, *Accommodations*, DOL.GOV, <https://www.dol.gov/agencies/odep/program-areas/employers/accommodations> (last visited Apr 20, 2022).

requests can range from a lighter mop, to talking calculators and detachable extendable arms.

¹⁴ Clearly, the drafters of the ADA did not wish to limit the creativity of those who may request reasonable accommodations and thereby overcome their disabilities. This bodes well for those who wish to embrace novel technologies to try and succeed at work. Interestingly, in most cases a physician themselves does not have adequate knowledge as to what would qualify as assistive technology.¹⁵ Instead, it is suggested that rehabilitation specialists or rehabilitation doctors will be better suited to assess what types of technology would be available to a curious person with a disability. *Id.*

Some common place examples of accommodations are as follows¹⁶:

- Physical changes.
- Accessible and assistive technologies.
- Accessible communications.
- Policy enhancements. *Id.*

Potentially, all of these areas could be implicated due to the advance of medical technology and the creation of a Cyborg class. Physical changes to a workplace could mean that a new technology such as an exoskeleton is waiting for an employee at their work location.

Accessible and assistive technologies are easily implicated as well considering the same example. Accessible communications could mean a device already in existence such as cochlear implants. Policy enhancements could include the allowance of Cyborg technologies as an accommodation into the workplace. The scope of how employees could succeed at

¹⁴ Disability Rights California, *Obtaining Assistive Technology Through Your Employer*, DISABILITYRIGHTSCA.ORG, <https://www.disabilityrightsca.org/system/files/file-attachments/558001.pdf> (Last visited Mar 11, 2022).

¹⁵ US Department of Labor, *Supra* note 13.

¹⁶ Disability Rights California, *Supra* note 14.

work is only limited by the work ethic and imagination of scientists, medical professionals, and inventors as new products are created and modified for these needs. The issue then becomes how our courts will grapple with such technologies and evaluate them under the ADA. It will be an exciting but tumultuous time for the ADA due to these advancements and coming legal battles.

POLICY DEBATE

In *Citizen Cyborg*, it is contended that the future will be governed by two political sides to the issue of the assistive technologies debate.¹⁷ In this groundbreaking book the author contends that the two political ideologies will be divided into:

- 1) Transhumanists, who hold that citizenship will be about personhood and not humanness.¹⁸
- 2) Bio-luddites, who will argue human racism.¹⁹

“Transhumanists” will be the group who wish to extend personhood to computers robots and evolving technology that will one day acquire intelligence and possibly free will. This group will contend that intelligence is what qualifies someone for personhood. Meanwhile, “Bio-luddites” will be advocates of an old fashioned human centered approach only extending personhood to humans. As technology progresses these two ideologies have the potential to clash in the ADA framework as the technologies will be able to extend human life and create potential machinery which exceeds the capacity of humans to reason or function.

As futuristic as these concerns sound, it is becoming increasingly apparent that

¹⁷ James Hughes, *Citizen Cyborg* (2004).

¹⁸ James Hughes, *Citizen Cyborg* 78 (2004).

¹⁹ James Hughes, *Citizen Cyborg* XV (2004).

technologies will move at lightning speed and allow for human consciousness to survive and thrive in a myriad of forms. Consider, upload-able consciousness or at a more simplistic level a computer chip brain implant. Before reading this text, I would have thought that these technologies would emerge hundreds of years from now. *Citizen Cyborg* presented the compelling case of “Moore’s Law”.²⁰ This data driven “law” shows that the “resulting processing power of computer chips has doubled every year since the 1970’s”. *Id.* Consider that computers are doubling in efficiency every year or so. Further, it is contended in *Citizen Cyborg* that human level artificial intelligence will be operational by 2050.²¹ Additionally, nanobots, microscopic robots the size of viruses may soon roam bodies to fix issues within it.²² If these predictions sound too alarmist consider cochlear implants, which are currently assisting deaf people to great success.²³ Even if these predictions do not bear out the law will still be hard-pressed to keep up. James Hughes argues that the “Bio-luddites” will insist that people “die on time”, while the “Transhumanists” will potentially advocate citizenship for computers who may be self-aware.²⁴ This argument has political as well as religious connotations and will therefore unfortunately spur bitter arguments on all sides. Other party lines will undoubtedly be implicated, with the religious, Republican, or Democrat, economic class etc. all likely joining the fray on whatever side they also so choose. Couple all this with a judiciary with different political leanings, motives, and life experiences and it sounds like a recipe for confusion. James

²⁰ James Hughes, *Citizen Cyborg* 4 (2004).

²¹ James Hughes, *Citizen Cyborg* 5 (2004).

²² James Hughes, *Citizen Cyborg* 6 (2004).

²³ James Hughes, *Citizen Cyborg* 17 (2004).

²⁴ James Hughes, *Citizen Cyborg* xiv (2004).

Hughes contends that those tasked with anticipating the future can often panic over technological advances.²⁵ This assertion does not bode well for the ADA which will be in the middle of the legal crossfire due to reasonable accommodations, evolving technology, and those with medical needs for assistive devices.

WORK RELATED VS PERSONAL ACCOMODATIONS

Employers are generally not required to provide accommodations of a personal nature under the ADA.²⁶ The technology requested under the ADA must be framed in such a way as helping with the essential functions of the job. If an employee requests a personal accommodation from an employer, under the ADA framework the employer need not provide this accommodation. The request has to be related to the employment and tailored to essential functions of the job. So, an employee with an accommodation request that would help them medically, or in another sphere not relating to work, will not have this request granted under the ADA. As medical technology progresses a clear demarcation for courts under the ADA will be if the accommodation is for one of personal usage or to help with essential functions of a job. You could see a “Bio-luddite” leaning bench often ruling that newfangled medical technology is for “personal use” where a “Transhumanist” leaning judge will be more likely to rule that an accommodation request, in a new technological area, will relate to the essential functions of a job. As mentioned above, there will also be different political ideologies which will intersect at

²⁵ James Hughes, *Citizen Cyborg* 61 (2004).

²⁶ Job Accommodation Network, *Personal Assistance in the Workplace*, ASKJAN.ORG, <https://askjan.org/topics/persassist.cfm> (last visited Mar 2, 2022).

this crossroad, some arguing for technological equality for all, while others may likely argue that any medical advantage garnered is part of the free market system and available only to those who can afford such luxuries.

TRANS-HUMANISTS

According to James Hughes “Transhumanists” need to enlist those who are oppressed by their bodies and create an inclusive atmosphere for all beings.²⁷ He even argues that dolphins, great apes and whales should be brought into the fold and afforded equal rights. *Id.* Obviously, such an inclusive grouping would cover robots, Cyborgs and those with medical enhancements as well. He declares that the motto for this new political ideology should be to “guarantee the right of all persons to control their own bodies and minds.” *Id.* It is even advocated that the United States should open an “Office of Technology Assessment” where new technologies can be studied for efficacy and understood by the government. *Id.* Such a proposal undoubtedly has implications for the ADA. One wonders if such an office would evaluate ADA claims pertaining to what is a reasonable accommodation? A “Trans-humanist” judge would be likely to embrace new technologies and extend the borders of what is a “reasonable accommodation” as society progresses. It is unclear whether this political ideology will actually form. If these ideologies do form and gain momentum than their arguments and mindsets will likely be heard in courts.

²⁷ James Hughes, *Citizen Cyborg* 261 (2004).

BIO-LUDDITES

A conflicting author, Francis Fukuyama, contends the “Bio-luddite” position. It is his contention that if we go too far down the “Trans-human” path, we will lose what makes us human, “the most significant threat posed by contemporary biotechnology is the possibility that it will alter human nature and thereby move us to the “posthuman” stage of history.”²⁸

Fukuyama contends that through the evolution of technology we risk losing our humanity entirely. This is the reverse of the position held by “Transhumanists” in that this new future of ours is seen as a detrimental outcome rather than a positive outcome. If a judge were to hear an ADA case with this philosophy as a guidepost they may very well conclude that a “reasonable accommodation” is “not so reasonable”, if it alters a human being too much. This is an interesting proposition for future courts to consider because we could one day see plaintiffs with mechanical bodies and structures surpassing our wildest imaginations. Even if progress is slower than some of the authors mentioned anticipate, we could still see this ideology come out in small ways as an emotional response to a rapidly changing world.

ADA ISSUES FOR CYBORGS

“Bio-luddites” will argue that these newfound “reasonable accommodations” are perversions of the natural order, while “Transhumanists” will seek to warmly embrace such technologies. The undue hardship prong (under the ADA) will likely be implicated as well, since some potentially helpful technologies will likely be extremely expensive in their

²⁸ Francis Fukuyama, *Our Posthuman Future* 7 (1 ed. 2002).

experimental or early stages. Defendants in a failure to accommodate case need only point to the cost and novelty of new medical technology and potentially win the first rounds of case law to be generated on Cyborg technologies (under an undue hardship theory). Interestingly, as we saw with the smartphone evolution, costs went down as technology progressed. The seemingly gigantic and expensive “cellphones” of the 1990’s have been scaled down and made more affordable as the years have progressed. Given, “Moore’s Law” and the implications it has for the pace of technology, it is likely that early undue hardship victories for defendants will only be temporary because cost will go down as efficiency and technology evolves, thus weakening arguments under the undue hardship prong.

Another issue that I foresee, is that the courts will be slow to grasp, understand, and embrace scientific and medical breakthroughs. This is due to a lack of understanding and scientific foundational knowledge by the court. Consider, our current legal training which is largely bound by precedent. How much scientific or medical training does even the most well-rounded judge have? Perhaps, Social Security Hearing Judges will be better placed to tackle nuanced questions that may arise under the ADA and advances with medical technology. However, Social Security Judges understanding of the ADA and employment law may not be as well rounded as judges with less medical knowledge. Consider that, “Judges are trained to perform legal analysis. No one goes to law school to become a scientist. Few go to medical school or enroll in a Ph.D. program in the sciences because they have a penchant for law. The two fields represent two entirely different ways of thinking, are governed by two entirely

different epistemologies and employ two nearly incompatible methods of analysis.”²⁹ This will be an interesting dilemma that will likely cause problems simply due to the fact that technology will continue to evolve in complexity at a fast rate. How judges with entirely different training and mindsets will be able to comprehend scientific innovation is an interesting and troubling question.

Human Resources Department’s will possibly have some of the same issues that the courts will above. How are employers supposed to stay current with medical technology as it progresses? It will be hard for human resource professionals to stay abreast of medical advances and try to understand what may or may not be feasible. Ultimately, it is likely that it will be incumbent upon disabled employees to research possible accommodations themselves and then have to educate possibly skeptical human resource persons with their findings. This raises an issue for those who may be hindered in their research or their advocacy by the very disability they are trying to accommodate.

Ironically, it may be that those with assistive technology outperform those without it in the near future.³⁰ Consider, someone with an assistive device implanted in their body that allows them to function at beyond human capacity, increased cognitive function or bodily function (say never tiring if they have a prosthetic limb). *Id.* How will the court of the future grapple with a once disabled employee who may now be “better abled” than their peers due to a reasonable accommodation? *Id.* Potentially, the entire ADA framework could be turned on its head when a once disabled employee is reasonably accommodated and suddenly outperforming

²⁹ Radley Balko, *Judges are terrible at distinguishing good science from bad. It’s time we stopped asking them to do it.* THE WASHINGTON POST (Sept. 28th, 2017), <https://www.washingtonpost.com/news/the-watch/wp/2017/09/28/judges-are-terrible-at-distinguishing-good-science-from-bad-its-time-we-stopped-asking-them-to-do-it/>.

³⁰ Laurie Schaller, *supra* note 5.

their peers to a striking extent. Would the courts find it to be a reasonable accommodation if an employee was suddenly gifted superhuman abilities thanks to science? If everyone else is accommodated with a futuristic reasonable accommodation, would those without such enhancing equipment now be the new disabled? Regardless of your opinion, these questions will need to be answered in the coming years by courts everywhere and lawsuits involving the ADA. The days of saying, “that’s far off into the future” are growing fewer in number.

Another potential issue will be the resentment and stigma of those who are not disabled. If the disabled are suddenly outfitted with revolutionary technology and then nondisabled, then there could be new forms of discrimination against medical technologies itself or those who have enhanced capabilities, due to new and innovative technologies. One could feasibly see legislation such as a hypothetical Americans with Medical Enhancements Act “AMEA” being passed due to newfound issues based on discrimination rooted in the accommodations themselves rather than the disabled person. Employers may yet say that the accommodation is too new, dangerous, or otherwise unworkable under the ADA, thus opening a new area of discrimination based solely upon accommodation types themselves and not on the plaintiff per se.

CYBORGS AND FRICTION WITH OTHER PROTECTED CLASSES

Reverse discrimination is an interesting issue that could arise with Cyborgs and the ADA. “Because anti-discrimination laws were originally enacted to prevent discrimination against minorities and groups that were historically disadvantaged and denied opportunities in the workplace, there has sometimes existed a perception that members of majority groups are not protected by the same laws. However, these laws generally prohibit all forms of discrimination

based on protected characteristics, including those against members of a majority group (as established by the U.S. Supreme Court's 1976 *McDonald vs. Santa Fe Trail Transport Co.* decision).”³¹ Using the above definition for reverse discrimination, we could run into the same issue with the non-disabled and the disabled. The nondisabled potentially could claim discrimination if the disabled are afforded accommodations which greatly help them, while the nondisabled are stuck without any newfangled medical advancements paid for by the employer.

The past norm has been for disabled employees to hopefully achieve comparable performance to their nondisabled peers through reasonable accommodations. As discussed above, with the influx of technology, outperformance becomes a very real possibility. If other protected classes or groups do not achieve the same advantage as the disabled would there then be an opportunity to bring a claim, based on not receiving the same advantage? This could potentially lead the ADA into a situation where it may clash with other protective legal frameworks if it benefits the disabled at the expense of another group not usually afforded a “reasonable accommodation”. Imagine that a disabled employee is given an accommodation which enhances their performance beyond normal levels. This employee is now drastically outperforming other employees who were not given the same accommodation and is thereby granted promotions, pay increases etc. Would another employee who is also a member of a different protected class now have a claim for unequal treatment or reverse discrimination? It is yet another interesting question that needs to be addressed by the judiciary before such cases may arise. This proposition and reverse discrimination claims would fit neatly into a “Bio-luddite” political stance as discussed previously. Those thinking that the world is moving too

³¹ FindLaw, *Reverse Discrimination*, FIND LAW, <https://www.findlaw.com/employment/employment-discrimination/reverse-discrimination.html> (last visited Mar 2, 2022).

fast may use these types of claims to indirectly detract from any gains made by the ADA in the coming years. It very well could be that the “Bio-luddite” position is strengthened by the two opinions of those who feel marginalized due to not receiving an accommodation and those who feel that those accommodations are too much anyways (or too strange). There is a strange common ground that these two mindsets could find and use as fuel to fight legal battles under the ADA framework against technological progress.

ROBOTS AND CYBORGS WHATS THE DIFFERENCE?

Robots will undoubtedly progress on a similar trajectory to that of Cyborgs. Ultimately, the line may blur as more and more modifications are interfaced into or upon the human body. Professor David Allen Larson asks the question if lawyers will one day be replaced by robots themselves?³² While this question is somewhat beyond the scope of this paper, it nonetheless asks the same question about the intersection between humans and robots. Professor Larson posits a similar question asking if robots or some hybrid thereof could “reason even “better” than humans?”*Id.* Robots and Cyborgs are on a parallel and interesting path into the future as also argued by James Hughes. Mr. Hughes argues that we will have human level artificial intelligence by midcentury. This intersects with Professor Larson’s question and makes it clear that this will be a coming issue. Professor Larson even argues that artificial intelligence can work better than humans as mediators. *Id.* It is beyond the scope of this paper to draw a clear technical distinction as to when a person becomes a robot or vice versa. The issue is further complicated by Chimeras or half animal and half human (or some variation thereof) hybrids

³² David Allen Larsen, *Artificial Intelligence: Robots, Avatars, and the Demise of the Human Mediator*, 25 OHIO STATE JOURNAL ON DISPUTE RESOLUTION (2010).

which James Hughes argues will also be present.³³ Chimeras could potentially create further issues under the ADA by interfacing humans with animal parts as a reasonable accommodation. If this seems to Sci-Fi, I must note as I did at the start that I could technically be considered a chimera as well as a Cyborg since my numerous valves have contained animal components in addition to metallic materials. Interestingly, Professor Larson mentions that households already have Roomba vacuums, and Siri's or Alexa's.³⁴ My household is currently maintained by a Roomba vacuum and I am listening to Alexa playing some classical music as I write this. I see this realization, that I already have robots in my home, as solid evidence that there will only be more of these types of technologies well into the future. Depending on how the above-mentioned political debates go, we could potentially see robots one day attain equal rights as humans.

TECHNOLOGICAL IMPLICATIONS

Tesla, has been under scrutiny for recent accidents involving their self-driving cars killing people. While mostly a torts issue, one can easily see the connection to the ADA. As these cars become more affordable they will undoubtedly be used by disabled commuters and potentially, workers in the form of delivery drivers, sales professionals and other industries that could utilize auto-pilot driving for their employees. In one case against Tesla, a commuter claims to have been the victim of auto-pilot gone wrong. The plaintiff claimed here that he utilized his cars autopilot only to be thrust headfirst into a

³³ James Hughes, *Citizen Cyborg* 92 (2004).

³⁴ David Allen Larsen, *supra* note 32.

highway median.³⁵ Tesla, in turn claims that the plaintiff must not have heeded the autopilots numerous warnings and thereby blames the human driver. *Id.* Regardless, over who is correct, it appears that courts are starting to grapple with newfangled technologies within our legal frameworks. It will be interesting to note if courts will allow self-driving cars as a reasonable accommodation under the ADA thus opening entire industries to the disabled that were once barred. There has also been a string of cases involving airline pilots who were argued to have been negligent by “turning autopilot off”. In the early 1980’s a large air force plane, the Boeing EC-135 a large command and control plane crashed with a crew of seventeen, four authorized observers (including two spouses) killing all on board. The ensuing litigation on behalf of the deceased had the plaintiffs contending that there was an autopilot malfunction.³⁶ The court found that the technicalities involved did not allow for the Air Force to know that the issues with the autopilot could have been fatal. Again, this is a torts framework, yet the cross-doctrine implications still remain, if courts continue to maintain that artificial intelligence may be more competent than humans in some areas. While it is unclear what this means for the ADA the effect that it could have on reasonable accommodations could be huge. How could a successful defense of undue hardship be brought, if artificial intelligence that served as a reasonable accommodation was even more efficient? While there are no easy answers, it is clear that the implications will be large.

³⁵ Sean O’Kane, *Tesla Autopilot, distracted driving to blame in deadly 2018 crash*, THE VERGE, <https://www.theverge.com/2020/2/25/21153320/tesla-autopilot-walter-huang-death-ntsb-probable-cause> (last visited Feb 25, 2020).

³⁶ *In re Aircraft Crash Litig.*, 752 F. Supp. 1326, 1332 (S.D. Ohio 1990).

CYBORGS AND EXOSKELETONS

A medical article pointed out that the 2019, World Cup in Brazil was commenced with a once paralyzed man kicking the first kickoff. Using an exoskeleton powered by his mind he was able to do this.³⁷ Over 118 companies worldwide are estimated to be a part of this industry. *Id.* One Law Review Article thoughtfully pointed out that “Human-enhancing devices via machine-interface are rapidly approaching mass-marketability.”³⁸ To me this means that humans and machines will merge closer and closer together. Potentially, it is argued that subconscious or conscious thoughts could one day be used to move devices. *Id.*

First it is important to define Cyborg and Exoskeleton. The above-mentioned article stated that:

“a cyborg is generally defined as a human-machine interface contrivance.”³⁹

According to this article Cyborg technologies can be:

1. “Restorative, in that they restore lost functions and replace lost organs and limbs.”
2. “Normalizing, in that they restore some creature to indistinguishable normality.”
3. “Reconfiguring, creating posthuman creatures equal to but different from humans.”
4. “Enhancing, the aim of most military and industrial research.” *Id.*

³⁷ Dr. Bertalan Mesko and Dr. Pranavsingh Dhunoo, *The State Of Exoskeletons In 2022*. THE MEDICAL FUTURIST, (Feb 8, 2022), <https://medicalfuturist.com/the-state-of-exoskeletons-in-2022> .

³⁸ Barbara P. Billauer, *The Bionic Plaintiff and the Cyborg Defendant: Liability in the Age of Brain-to- Computer Interface*, 25 SSRN Electronic Journal (2021), pgs. 39, 49, 50, 52 (last visited Mar 5, 2022).

³⁹ Barbara P. Billauer, *supra* note 38.

The article goes on to say that Exoskeletons are:

“an external skeleton that supports and protects a person's body.” *Id.*

Where a Cyborg begins and an Exoskeleton ends are topics worthy of papers themselves. Notably, the military is developing Exoskeletons which allow soldiers to carry heavy loads across vast distances. *Id.* In an employment context it is easy to see how devices such as these could be of benefit to employees in the labor industry. A German company, Cray X, has created a technology that helps workers lift up to 60lbs and even is equipped with a sensor that can warn them of probable lifting injuries.⁴⁰ In Japan, surgeons who once had to stand during surgeries for up to twelve hours are using a similar suit to support their backs called the Archelis suits. *Id.* One surgeon was described as saying that it made them less fatigued and more stable. *Id.* Such technology's offer much promise to the disabled and the ADA as a potential reasonable accommodation. Those jobs requiring manual labor, transportation, long hours of standing, or even lifting or moving, could all benefit from such technologies and will be the coming battlegrounds for the exoskeleton and reasonable accommodations debate.

Once disabled persons could now wear an exoskeleton which enables them to acquire superhuman strength. Delivery services such as Amazon could see productivity increases, manufacturing jobs could be affected, while even the United States Postal Service could seemingly benefit from the adoption of such technologies. Undoubtedly, the disabled will benefit in that conditions which once limited mobility, carrying ability, and employment opportunities will potentially be erased by such exoskeletons. It will be interesting to see if

⁴⁰ Dr. Bertalan Mesko and Dr. Pranavsingh Dhunoo, *supra* note 37.

such devices will be deemed a reasonable accommodation in the near future for disabled employees.

CYBORGS AND BRAIN IMPLANTS

As alluded to earlier, not all disabilities are physical. Emerging Cyborg technologies also holds vast potential for those suffering from cognitive or other issues. Elon Musk founded a company called Neural ink which endeavors to implant microchips in the brain that could then interface with phones or other smart technologies.⁴¹ Musk currently is the owner of a prototype monkey who has what he compares to “a Fitbit” in his skull with “tiny wires”.⁴² This device allows the macaque to play the hit 1980’s game “pong” with the researchers remotely, it also measures his movements. *Id.* Mr. Musk hopes that disabilities such as being paralyzed, brain injuries, memory issues and more are fixed. *Id.* Mr. Musk even hopes for telepathic communication, music recall, and the ability to play games in one’s mind.⁴³ Interestingly, he suggests the implant and price could be just a few thousand dollars. *Id.* Such a low projected cost could potentially open this technology as an “easy pass” in the ADA’s undue burden analyses.

Other researchers and groups are looking at interfacing the human brain with computers as well.⁴⁴ These technologies are hoped to research epilepsy, diluting pain, controlling sleep, or

⁴¹ The Medical Futurist, *Will We All Have To Become Biologically Enhanced Superhumans?*, THE MEDICAL FUTURIST (Jan 21, 2021), <https://medicalfuturist.com/superhumans-2021>.

⁴² Brandon Lingle, *With brain implants, the 'future's gonna be weird'*, MYSA (2021), <https://www.mysanantonio.com/sa-inc/article/Brain-implants-will-make-for-a-weird-future-16146961.php>.

⁴³ Brandon Lingle, *supra* note 42.

⁴⁴ The Medical Futurist, *supra* note 41.

to allow paralyzed people to move. *Id.* There is the hope that studying could be enhanced as memoires could one day be automatically photographic. Also sense organs located in the head could be enhanced, think of bat like hearing available for humans or smell filtration or enhancement, or even the ability to see microscopically. *Id.* Depending on price and feasibility this will be another issue for the ADA to grapple with in the future.

THE ADA AND COMPUTERS

One brave law review team posed the question of what would happen if a computer petitions a court to be granted personhood.⁴⁵ Surprisingly, the writers found that the computer should be given personhood. *Id.* Under, the current ADA framework courts have yet to give protections to any nonhuman entity yet. The writers point out that with enough intelligence all creatures seem to want autonomy. *Id.* Could a disabled computer be allowed protections under the ADA? The writers point out the nations who embrace autonomous computers may have a huge advantage in the geopolitical realm. *Id.* They argue that productivity, could be increased and rates of technological, innovation, and production could skyrocket by societies who welcome intelligent computers into the realm of personhood.⁴⁶ From that policy perspective it would be interesting to see how receptive American courts will be, especially if competitor nations such as China, or Russia expand the realm of personhood before we do. This is a “Transhumanist” stance that predicts productivity will be intertwined with how the law deals with new technologies that may be able to reason for themselves. There is also an intersecting

⁴⁵ F. Patrick Hubbard, DO ANDROIDS DREAM? PERSONHOOD AND INTELLIGENT ARTIFACTS, 83 Temp. L. Rev. 405 (2011).

⁴⁶ F. Patrick Hubbard, *supra* note 45.

parallel to corporations, which are granted the title of personhood (despite being actual persons) under the law, which could be used by advocates to expand the definition of personhood. *Id.* If technology progresses and humans could merge with computers it would also be interesting to see if this would qualify as a reasonable accommodation.

ECONOMIC CLASS ISSUES

There is also the potential for some major issues for these technologies under the ADA to create some major class issues. Some of these technologies which create Cyborgs will undoubtedly be expensive and therefore cost prohibitive for employees. How will the government respond with such an issue? “Arthur C. Clarke, the controversial futurist and science fiction writer, famously said that any sufficiently advanced technology is indistinguishable from magic.”⁴⁷ With this in mind, if those with wealth have access the “magic” of new medical technology and those without wealth do not, how will our society respond? Interestingly, as already pointed out the disabled class could potentially benefit if they can access these new technologies and prove they do not amount to an undue hardship for employers in the ADA framework. As these devices become cheaper and more prevalent one will likely see the class divide shrink. The EEOC has given guidance stating that undue hardship:

“The Equal Employment Opportunity Commission's (EEOC's) guidance defines undue hardship under the ADA as an action requiring *significant* difficulty or expense as it relates to

⁴⁷ Harold Thimbleby, *Technology and the Future of Healthcare*, NATIONAL LIBRARY OF MEDICINE (2014), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4147743/>.

the individual business. A determination of undue hardship should be based on several factors, including.”⁴⁸

- “The nature and cost of the accommodation needed.”
- “The overall financial resources of the facility making the reasonable accommodation, considering the number of people employed at the facility and the facility's expenses.”
- “The overall financial resources, size, number of employees, and type and location of facilities of the employer (if the facility involved in the reasonable accommodation is part of a larger entity).”
- “The type of operation of the employer, including the structure and functions of the workforce, as well as the geographic separateness and the administrative or fiscal relationship of the facility involved in making the accommodation to the employer.”
- “The impact of the accommodation on the operation of the facility.” *Id.*

We see another potential area of confusion under the above undue hardship framework if an accommodation is not overly burdensome to provide to a disabled employee as an accommodation but is nonetheless cost prohibitive for a nondisabled employee to acquire on their own. Picture a governmental entity with vast pockets who can provide an accommodation which is not overly burdensome due to their size. Contrast this with a nondisabled employee who

⁴⁸ The Society of Human Resource Management, *How Do I Know If a Work Accommodation Will Create An Undue Hardship?*, SHRM (Oct 29, 2021), <https://www.shrm.org/resourcesandtools/tools-and-samples/hr-qa/pages/createanunduehardship.aspx>.

may be working at this governmental body and yet whom does not make enough money to afford this new form of “magic” themselves. Future, courts will hear arguments based on economic unfairness and how disabled employees are given an economic gift that their nondisabled employees cannot afford.

Conversely, it is optimistically pointed out that “This virtuous circle of using technology to make technology ensures prices drop, market share increases, and profit margins increase, which in turn allows the manufacturer to invest in more cunning production and distribution technologies.”⁴⁹ It could be the case that these new Cyborg creating technologies under the ADA are very cheap due to their level of innovation. I would contend however, that much like the cellphones of the 1990’s there will be a period of time where only the wealthiest can afford such technologies until they become mainstream and widely adopted. Even if technology optimistically keeps prices down for ADA accommodation requests there will still be the issue of courts not understanding new technologies and possibly being inundated with novel claims. The technical training of the judges regarding medical technology may be woefully inadequate. Indeed, if something is so revolutionary successful and technologically innovative as to keep prices low, then there is the new risk that the court will be slow to understand this new revolutionary technology which is a technological as well as a financial marvel.

Also, when considering undue hardship “before denying an accommodation request because of undue hardship, employers are encouraged to explore different options that might make a seemingly difficult accommodation possible. If, for example, an accommodation seems to pose a financial hardship, the employer could look to outside agencies for potential funding

⁴⁹ Dr. Bertalan Mesko and Dr. Pranavsingh Dhunoo, *supra* note 40.

as well as investigate tax credits that might assist in fulfilling an employee's request. Employers also are encouraged to be creative and determine if a different accommodation would meet the employee's needs.”⁵⁰ This raises the specter of governmental involvement in possibly funding new medical technologies or at the very least tax credits that may arise due these newfangled ADA issues. The government may need to increase governmental spending to investigate new assistive technologies, or we may see big businesses who create these technologies lobbying on behalf of the disabled in an effort to sell more merchandise. Given the United States capitalist system it seems that any project or law hindering business or enhancing business will garner attention, funding and at a minimum some form of increased dialogue. While it is beyond the scope of this paper to point out the financial implications of new technology, it is nonetheless an important point that there will be many groups interested in emergent technologies and trying to turn a profit. The question then becomes one of whether death itself could be “bought off”. That is to say that with enough money and resources could the wealthiest of the wealthy prevent death itself? In a sobering statistic, the average maximum reported age seems to plateau at about 115 years.⁵¹ If medical technology were to boost this average or if Cyborgs push the average age higher, we could see an interesting interplay with the ADA and Age Discrimination Act (ADEA) being invoked together.

A law firm has pointed out that unlike the ADA the ADEA (Age Discrimination Act) does not require employers to make accommodations. “Further, the EEOC notes that workers

⁵⁰ The Society of Human Resource Management, *supra* note 48.

⁵¹ The Medical Futurist, *Can Money Buy You Longevity And Health?* – WWW.THE MEDICAL FUTURIST.COM (Nov 22, 2018), <https://medicalfuturist.com/can-money-buy-you-longevity-and-health>.

age 65 and older also may have medical conditions that would separately bring them under the protection of the ADA. If this is the case, you should keep in mind that these workers may request reasonable accommodation for their disability as opposed to their age, and that you should run through your typical interactive process with them.”⁵² This is another potential stumbling block for Human Resource Departments and employers who may not understand this distinction and may be unwilling to provide accommodations to elderly employees who may have medical conditions actually covered by the ADA.

COULD HUMANS BE REPLACED

James Lovelock, a famous British scientist and futurist, says that humans will possibly vanish from the earth and become extinct one day in the future.⁵³ While this undoubtedly a far reaching and somewhat extremist argument, it would be unfair for this paper to not at least put this fringe idea forward, since its ramifications to the ADA would be incomprehensible. Mr. Lovelock highlights the example of the computer that taught itself how to play the game “Go” and then shortly thereafter became the best “Go” player in the world. *Id.* “Today’s computers can already process data far faster than we can; with fully independent artificial intelligence, he says, tomorrow’s Cyborgs will easily become a million times smarter than we are.” *Id.* Mr. Lovelock goes on to state that this new type of creature would not continue in any sort of human form and would likely eliminate humans altogether at some point. *Id.* As pessimistic as this may sound, Mr. Lovelock contends that it is a “noble endeavor” that is a sort of “passing of the torch

⁵² Fisher Phillips, *EEOC Warns Against Age Discrimination And Other Workplace Concerns During Back-To-Business Push*, WWW.FISHER PHILLIPS.COM (June 12, 2020), <https://www.fisherphillips.com/news-insights/eecoc-warns-against-age-discrimination-and-other-workplace-concerns-during-back-to-business-push.html> .

⁵³ Corey Powell, *Cyborgs will replace humans and reshape the world, famed scientist says*, WWW.NBC NEWS.COM (Aug 25, 2019), <https://www.nbcnews.com/mach/science/cyborgs-will-replace-humans-remake-world-james-lovelock-says-ncna1041616>.

between species.” *Id.* Bio-luddite advocates or even judges who may fear such doomsday scenarios may rule differently in ADA cases with such pessimism in mind. It is important to consider that humans when faced with legal arguments founded in the extinction of our species may react in a variety of unpredictable ways.

CHANGING STEREOTYPES

The whole purpose of the ADA was to try and correct some of the stigma that the disabled unfortunately encounter on a daily basis and ensure the disabled can find meaningful employment. Historically, so much of National fitness was tied to the idea of personal fitness and well-being.⁵⁴ This is to say that, a “strong” nation wanted to have “strong” or “fit” citizens in other to outcompete other nations. *Id.* Sadly, those who could not keep up with their peers were regarded as “burdens”. *Id.* Gershon makes the startling point that the very word “handicap” has its origin in an old English game where a player would intentionally burden themselves for the next round after winning. *Id.* In many cultures around the world, the disabled are associated with bad luck and curses as well as stigma. *Id.* Unfortunately, stigma became entrenched in society and the disabled are often, even today regard as “less than” their health peers. Disability stigma can manifest in a variety of ways:⁵⁵

⁵⁴ Livia Gershon, *The Rise of Disability Stigma* - JSTOR DAILY.ORG (2020), <https://daily.jstor.org/the-rise-of-disability-stigma/> (last visited Apr 20, 2022).

⁵⁵ Arielle Silverman, *Disability Stigma and Your Patients*, Rehabilitation Research and Training Center on Aging With Physical Disabilities Agerrtc.washington.edu (2022), <https://agerrtc.washington.edu/info/factsheets/stigma>.

- “Social avoidance.”
- “Stereotyping.”
- “Discrimination.”
- “Condescension.”
- “Blaming.”
- “Internalization.”
- “Hate Crimes and Violence.” *Id.*

Due to the above negative effects it is certainly necessary that legislation such as the ADA exists and remains enforced. Critically, it should be updated with technological innovations and the attitudes of the time. Sadly, it is noted that those who are disabled are often regarded as “warm-but- incompetent.”⁵⁶ Further, regarding the disabled, paternalistic stereotypes seem to abound within society and culture as a whole. *Id.* This article makes the optimistic prediction that those who use such technologies may be seen as more competent. Think of Ironman, Inspector Gadget, or Robocop and their warm embrace by the media and Hollywood. Meyer and Asbrock, the two writers of this article, point towards positive media portrayals of those who use technological enhancements to make them appear competent to others. *Id.* The study found that “While the overall findings are somewhat mixed, to our knowledge, this is the first study showing that technology can affect stereotypes in society.” *Id.* This is an interesting implication for the ADA in that those who may utilize Cyborg technologies may be able to

⁵⁶ Bertolt Meyer & Frank Asbrock, *Disabled or Cyborg? How Bionics Affect Stereotypes Toward People With Physical Disabilities*, FRONTIERS IN PSYCHOLOGY.ORG (Nov 20, 2018), <https://www.frontiersin.org/articles/10.3389/fpsyg.2018.02251/full>.

shift the way they are perceived by courts and society. This could cut both ways for the ADA making courts more sympathetic or less sympathetic if they view the disabled as “not as” disabled. Such conclusions and calculations are simply predictions but they make for interesting discussion and fodder for future debates. Will public sympathy for the disabled decrease as technologies and the ability to correct disabilities flourish?

CONCLUSION

What is deemed a reasonable accommodation will have to change as technology progresses. Due to the pace, breadth, and scope of medical technologies that will allow the disabled to flourish, courts need to look forward and realize that what is deemed a reasonable accommodation will need to be anticipated, when the boundary between the digital age and our bodies merge together. Plaintiffs desiring or outfitted with implants in their heads, exoskeletons, nanobots etc. will pose an interesting conundrum for courts as they grapple with the ADA. What is an accommodation, what is reasonable, and what further problems are such examples of new questions that will be asked. “Transhumanists” (advocating new technology) and “Bio-luddites” (advocating natural order) will clash in viewpoint at the key intersection that is the ADA. Without forethought or preparation by the Supreme Court, confusion will arise as medical technology progresses. Assistive technology will only increase in its efficiency and it seems that the law should correlate on a parallel path with such progress. The only question remains how will humanity react to such changes and debates? Regardless of the answer, the ADA will be at a critical crossroads for these questions. The sooner that the courts realize their upcoming location the better our society will be prepared. Hopefully our society can open doors with technology and ensure a more robust and accommodating society for the disabled.

Possibly, a society where we all qualify as proud Cyborgs.