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**DECONSTRUCTING DISABILITY, ASSISTIVE TECHNOLOGY:
SECONDARY ORALITY, THE PATH TO UNIVERSAL ACCESS**

by

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MPhil, Jawaharlal Nehru University, 2004

A dissertation submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy in Text & Technology
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ABSTRACT

When Thomas Edison applied for a patent for his phonograph, he listed the talking books for the blind as one of the benefits of his invention. Edison was correct in his claim about talking books or audio books. Audio books have immensely helped the blind to achieve their academic and professional goals. Blind and visually impaired people have also been using audio books for pleasure reading. But several studies have demonstrated the benefits of audio books for people who are not defined as disabled. Many nondisabled people listen to audio books and take advantage of speech based technology, such as text-to-speech programs, in their daily activities.

Speech-based technology, however, has remained on the margins of the academic environments, where hegemony of the sense of vision is palpable. Dominance of the sense of sight can be seen in school curricula, class rooms, libraries, academic conferences, books and journals, and virtually everywhere else. This dissertation analyzes the reason behind such an apathy towards technology based on speech.

Jacques Derrida's concept of 'metaphysics of presence' helps us understand the arbitrary privileging of one side of a binary at the expense of the other side. I demonstrate in this dissertation that both, the 'disabled' and technology used by them, are on the less privileged side of the binary formation they are part of. I use Derrida's method of 'deconstruction' to deconstruct the binaries of 'assistive' and 'main stream technology' on one hand, and that of the 'disabled' and 'nondisabled' on the other.

Donna Haraway and Katherine Hayles present an alternative reading of body to conceive of a post-gendered posthuman identity, I borrow from their work on cyborgism and

posthumanism to conceive of a technology driven post-disabled world. Cyberspace is a good and tested example of an identity without body and a space without disability.

The opposition between mainstream and speech-based assistive technology can be deconstructed with the example of what Walter Ong calls ‘secondary orality.’ Both disabled and non-disabled use the speech-based technology in their daily activities. Sighted people are increasingly listening to audio books and podcasts. Secondary Orality is also manifest on their GPS devices. Thus, Secondary Orality is a common element in assistive and mainstream technologies, hitherto segregated by designers. The way Derrida uses the concept of ‘incest’ to deconstruct binary opposition between Nature and Culture, I employ ‘secondary orality’ as a deconstructing tool in the context of mainstream and assistive technology.

Mainstream electronic devices, smart phones, mp3 players, computers, for instance, can now be controlled with speech and they also can read the screen aloud. With Siri assistant, the new application on iPhone that allows the device to be controlled with speech, we seem to be very close to “the age of talking computers” that William Crossman foretells. As a result of such a progress in speech technology, I argue, we don’t need the concept of speech based assistive technology any more.

Dedicated to everyone and everything that has ever been marginalized; and to my small little family that got decentered when this dissertation became the transcendental signified.

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This dissertation went through many ups and downs. Some of them did not have anything directly to do with the dissertation or its author. The cynicism prevalent in the political and academic environment may make one ponder many times about the fecundity or futility of any meaningful academic endeavor. Yet, if my dissertation has been a journey through a desert, I enjoyed a lot. I enjoyed all the oases I came across. The mirages on the way were tempting, but not enough to dissuade me from the correct path I took and stuck to all through this academic journey.

For a successful completion of this journey, I would like to give credit to Dr. Anthony Grajeda. He took out time from a very busy semester to read my dissertation and offered valuable suggestions to improve on my work. His course pertaining to visual technology offered me valuable insights in to the topics I cover in this work. In addition to his intellectual support, his moral support was also required, and he offered it to me in abundance during some tough times. I want to sincerely thank him for helping me accomplish what seemed impossible just a few months back.

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CHAPTER ONE. INTRODUCTION

This dissertation sets out to deconstruct the concept of speech-based technology as assistive technology specifically designed for the visually challenged or print disabled people. Assistive technology, also known as AT, as defined by Kevin Crow, is a collective name for software or devices “designed especially for people with disabilities with the aim of providing such people means to function normally in the world.” Assistive technology has, as Marcia Scherer explains in her *Living in the State of Stuck: How Assistive Technology Impacts the Lives of People with Disabilities*, “contributed significantly in the attempts of leveling the social, academic and professional fields for the blind and visually challenged individuals” (23).

As I demonstrate in this dissertation, due to significant changes in society and with evolution of technology, the terms ‘Disability’ and ‘Disabled’ have undergone a theoretical displacement. Consequently, I argue, the concept of an exclusive technology for disabled people needs to be reexamined as well. As I enunciate later in this dissertation, speech--based AT has many enabling aspects vis-a-vis the print disabled individuals, yet, as this dissertation attempts to establish, assistive technology based on speech has served its exclusive purpose towards the print disabled individuals, and now this technology need not be preceded by the qualifier ‘assistive.’ Technology, in my view, is by definition assistive. The qualifier ‘assistive’ in ‘assistive technology’ is, therefore, redundant, and serves the only purpose of keeping the disabled in a segregated technology zone.

Background and Rationale

When Thomas Edison applied for a patent for his phonograph, he listed audio books for the blind as one of the benefits of the device (Markovic). Ever since Edison's prediction, speech technology was relegated to the marginalized territory of AT. There is no denying that Talking books or audio books have indeed immensely helped the blind to reach their academic goals. They have also been used by the blind for pleasure reading. But several studies have demonstrated the benefits of audio books for people who are not defined as disabled.

The qualifier 'assistive' implies that the technology is specially designed for disabled individuals. The fact that many non-disabled frequently use speech technology in their diurnal activities provides ample reason for us to reexamine and deconstruct the concept of the speech based AT. When a speech based device is categorized as AT, it becomes limited in scope. It is targeted to very few individuals— those with 'special needs,' those with 'disabilities.' The label of assistive technology also ensures a higher price tag, the justification being that it is a specialized product. Thus, however benevolent, the concept of Assistive Technology perpetuates the segregation between the visually challenged and sighted populations around the world. The segregation is apparent in the fact that those who cannot read print on their own are made to pay significantly more to be able to use the same device as their sighted counterparts. For example, sighted people can reasonably satisfy their computer-related needs with a \$400 computer. A blind individual, on the other hand, has to buy a screen reading software that costs about \$1000, to be able to use that \$400 computer. That blind individuals have to buy expensive software to be able to use their computer is not in the spirit of the ideals of equal access to technology and learning environments championed by the proponents of Universal Design (UD). The concept of

UD argues for “providing a framework for considering how products and environments can be designed to accommodate the broadest range of users” (Bowe 13). The history of UD will show that the proponents of UD first campaigned against barriers in the built environment: architectural design, public buildings, housing establishments; of late the principles have been used to demand product design that can be used by all individuals, regardless their disability.

The latest offshoot of UD is Universal Design for learning (UDL) which brings the concept of UD to the educational sphere. Universal Design applied to learning or instruction insures that materials, activities, or goals are attainable by individuals who may have differences “in their abilities to see, hear, speak, move, read, write, understand English, attend, organize, engage, and remember” (Allen 1). Because UDL is more focused on learning environments and technology, its critical analysis is more relevant for this dissertation, than that of general philosophy of Universal Design principles.

The proponents of the UDL do not seem to mind if the user has to pay a very high price for accessibility. Their concern is accessible design, even if the user has to pay for it extra. Most of the solutions that UDL proposes to accommodate students with diverse needs are largely dependent on Assistive Technology. Some scholars, including David Rose and Anne Meyer, have delineated differences between UD and Assistive Technology and have argued in favor of the former (Bowe 21-23). However, at this point UDL is extremely dependent on Assistive Technology. The situation is not likely to change in the current framework of the UD and UDL principles. According to Rose and Meyer, the most vocal proponents of UD and UDL, “There will always be need for Assistive Technology” (45).

The common theme in the literature on UDL is that the teachers should make the teaching contents available in multiple formats so that pupils with diverse needs may access them based on their personal choice (Rose and Meyer 6). However, if a teacher emails the lecture in an electronic format, for instance, a blind student will have to use an expensive screen reading software to be able to read it. Without the screen reading technology, the material remains inaccessible. Thus, as far as blind students are concerned, there is a contradiction between the spirit of UD and UDL. I propose in this dissertation a theory of Universal Access that resolves the conflict between UD and UDL.

UDL assumes that Assistive Technology is universally available. This assumption is flawed in the context of less developed parts of the world. Access to a computer is beyond the reach of any disabled individual in under-developed places of the US and the rest of the world. Access to Assistive Technology, which is more prohibitively expensive than computers, is much further apart. Even if some fluke of chance gets a disabled individual a computer, there are more far-reaching challenges of proper infrastructure, internet access, and so on.

Moreover, UDL fails to see the problem of accessibility from the perspective of differently-abled teachers. A teacher who is blind often finds it difficult to operate technology available in the classroom. UCF classrooms, for example, have a touch screen-based console that makes the technology in the class virtually inaccessible. The blind teacher can lecture in that classroom but cannot follow principles propounded under UDL.

UDL, to say the least, is limited in its perspective about accessibility of electronic spaces and learning environments. I consider a broader perspective of accessibility for my research. This dissertation proposes a new theory of Universal Access which is based on the mainstream

speech technology. Speech generated or mediated by technology is also referred to as digital orality, and Walter Ong's concept of 'secondary orality,' signifies the same. Because Apple has built accessibility into the very design of their iPhone, I suggest iPhone as a model to emulate in order to enable equal access for all: the same functionality, on the same device, at the same price. True to the spirit of Universal Access, Apple's iPhone can be used by blind users out of the box, without any assistance. It can be called a trailblazer in resolving the problem of inaccessibility of the text on the screen for the print-disabled. Subsequent to iPhone's success, many Android based phones and most Apple products can now be used by blind users without any additional technology or any external help.

Technology scholars like Marshall McLuhan have been writing about technology driven return to 'primitive orality.' The speech we find on the latest communication devices reflects Walter Ong's conception of 'secondary orality' rather than the primitive or preliterate orality. What Ong defines as 'secondary orality' is the orality mediated and influenced by the culture of literacy. In the case of 'secondary orality' speech and writing exist simultaneously. Take, for example, text-to-speech technology. This converts existing written text into speech. In the case of audio books, similarly, print books are converted into oral texts.

'Secondary orality,' in other words, deconstructs the binary of speech and writing. Western Metaphysics, in Jacques Derrida's view, has always privileged speech over writing. Derrida calls this privileging 'logocentrism.' A close reading of Martin Jay and Walter Ong, however, reveals that the academic world, contrary to Derrida's argument, has always privileged written text over spoken words ever since literacy became popular. Plato, a prominent target of Derrida's criticism, and who seems to be questioning the legitimacy of written text in *Phaedrus*,

could himself become so influential because his 'Dialogues' were transcribed into writing. Much before the invention of Gutenberg's printing press, which all but annihilated oral culture in the Western world, Plato had managed to vanquish orality by undermining Homer, a prominent bastion of orality. In *The Republic*, Plato outlines the dangerous impacts of a poet like Homer for the society. Plato uses this negative delineation to justify his idea of banishing of poets from the ideal state conceived by him in *The Republic*.

This shift of prominence, from orality to literacy, proved disastrous for the people with blindness and visual impairment. Before writing became prominent in Greece, Homer, a blind person, was considered the fountainhead head of knowledge. He seemed to know everything that was worth knowing in that world. From construction of a ship to treatment of an injured horse, all could be found in Homer's epics. In the world dominated by literacy, on the other hand, a blind person became synonymous with ignorance. Higher learning being possible only through visual means, blind people had to live without the knowledge that could help them find gainful employment. With their status marginalized, the survival of blind individuals became dependent on charity and goodwill of the society.

Thomas Edison's invention of the phonograph gave new hopes to the print-disabled and also to sound as the carrier of language, culture, literature, and knowledge in general. Alan Burdick in an article published in Harper's Magazine claims that the twentieth century was built for the ear. After 1877, when Sound was recorded for the first time on Edison's phonograph, "The subsequent age of industry brought new sounds, newer ways of capturing them, and an increasing urgency to do so." Burdick finds the improvement in sound technology as the most enjoyable element of the twentieth century. "Forget the images, forget the abstract paintings and

stuttering newsreels, forget all the visual jetsam that millennial enthusiasts recently forced us to revisit. To appreciate the twentieth century, it seemed to me, I should leave my eyes behind, plug in the headphones, and listen—to cable cars, calliopes, frog calls, Jupiter rockets, surgical banter, steam locomotives, punch clocks: the work songs of the whole carbon-based enterprise.”

Even though signs of ocularcentric bias abounded throughout twentieth century, in Burdick’s view, “golden age of sound never ended: it continues, occluded by the visual hegemony.” Visual hegemony has been more noticeable in the institutions of learning, including schools, colleges, libraries, cyber space, and other electronic media.

Most of the improvement in sound technology in twentieth century benefited the entertainment industry. Recorded sound was hardly used to convey specialized knowledge to the ‘mainstream’ population. Audio books for the blind was an exception, and it remained an exception for a while, till audio books became popular with people in general, even those who could read print. Orality has made significant inroads, people in general are using speech to gather knowledge and communicate information. The hegemony of the visual, nonetheless, is far from over. As Burdick suggests, “Historically, we are creatures of vision, slaves of the iris.”

Iris is all about visual. However, if we write the word ‘iris’ backwards it reads ‘siri’. Siri, formally Siri Assistant, is a program on the latest version of iPhone that allows users to verbally interact with their phone, and, in turn, with the rest of the cyber world. Popularity of Siri, and many other speech based applications, establishes the fact that we are now using speech technology for more than just listening to music. Digital orality is likely to become more prominent on iPhone and other electronic platforms as, in Burdick’s words, “Technology provides ever more sensitive methods of hearing, ever more accurate means of recording, and an

ever changing suite of sounds to assimilate.” This emergence of orality on iPhone has immensely helped blind and other print-disabled users, for whom iPhone has become an obvious choice for accessing all kind of information.

A plethora of third party iPhone applications have been prepared, and are being prepared, that cater to people in general but which can be extremely helpful to the people who cannot see. We can discuss, as an example, an application that lets the users read barcode on articles they buy from stores, or they can create their own bar code labels to attach to the articles they want to add bar code to. This kind of application can help a blind person organize his/her belongings such as books, CDs, clothing. In the Assistive Technology regime, this application would be categorized as blindness and/or low vision product; however, in the Apple app store this application is classified under Lifestyle.

Because Apple has laid down guidelines for app developers that ensure the applications can be used by print disabled users, almost all iPhone applications can be used by all the users. Moreover, iPhone devices, and many other Apple products, offer an accessible platform for education-related applications. iPhone, thus, helps materialize what I call the concept of Universal Access. iPhone is the first device that resolves the binary opposition between mainstream technology and Assistive Technology. It is time now, my dissertation rationalizes, that the principles of Universal access be followed by all the designers of technology.

Methodology

I use Jacques Derrida’s technique of deconstruction to displace the notion that speech-based technology is only for the print-disabled. As Jonathan Culler explains it, “Deconstruction

refers to all of the techniques and strategies used by Derrida in order to destabilize, crack open and displace texts that are explicitly or invisibly idealistic.” The terms ‘text’ and ‘idealistic’ need some explaining and contextualizing in this definition.

The word ‘text’ has a larger semantic field than the written text. Any ‘sign’ that conveys meaning is referred to as ‘text’ by semioticians. For such critics a traffic light is a text, a sign signifying whether to stop or to proceed. In semiotics, the science of signs, ‘sign’ and ‘text’ are used interchangeably. When post-structuralist writers like Roland Barthes and Derrida discuss ‘sign,’ they expand on the notion of ‘sign’ introduced by Ferdinand de Saussure. Saussure’s *Course in General Linguistics* focused on the linguistic sign. A linguistic sign is composed of two parts, signifier and signified. The signifier is the form of the sign and signified is its content. To make it simpler it can be said, the word one looks up in a dictionary is the signifier and the definition one finds is its signified.

For Saussure, a structuralist, the signifier and signified hold together the structure of the sign. We are still largely governed by Saussure’s conception of language where, according to Terry Eagleton, “meaning is just a matter of difference” (111). For Saussure, as Eagleton explains, meaning is the result of division or articulation of the sign. Such a perspective about language inflicts segregation between the technology used by the disabled and that used by the able-bodied. Derrida, as I demonstrate later, deconstructs this notion of a fixed meaning/signified.

‘Idealistic’ denotes that a given ‘text’ has a rigid signification, or that the meaning of a given text is fixed. Deconstructionist critics like Derrida subscribe to a post-structuralist vision of signification. Derrida deconstructs the notion of idealistic signification to demonstrate that a sign

is mutable and that signifiers lead to no definite signified, instead merely leading to other signifiers. In a post-structuralist vision of language the dictionary does not lead to a signified but to a set of signifiers, leading only to an endless chain of signification.

That the relationship between a signifier and signified is neither permanent nor definite can be explained with the example of the changing structure of book. Book, in this dissertation, will serve as an important entry point in deconstructing the 'ideal' sign referring to speech technology. From scroll to the computer notebook, the structure of book has gone through many revolutionary transformations. David J. Bolter in his *Writing Space* discusses the changing structure of book. The net book and facebook did not come in to existence when Bolter wrote this book, so they are not discussed. However, audio books were very much in use for a long time before Bolter worked on the notion of writing space. One possible justification for Bolter not mentioning the audio books can be that audio books are all about speech and Bolter was concerned with the writing space, as opposed to the speaking space. The other possible justification is that audio books are not as mainstream as to merit a mention in the mainstream books.

Both these well-established notions can be deconstructed. Deconstructing the first supposed assertion (about writing space being different from speaking space) will take us to the speech versus writing debate as inscribed in Plato's *Dialogues*, mainly in *Phaedrus*. Derrida has offered a significant critique of the negative notion about writing as expressed in *Phaedrus*. Derrida's claim in *Of Grammatology*, that writing inheres to speech, deconstructs the opposition between speech and writing. Audio books offer the best example to establish that writing is

inherent in speech. Audio books are a spoken version of a written text justifying another of Derrida's claims made in *Of Grammatology*, namely that writing precedes speech.

Walter Ong's concept of Secondary Orality also deconstructs the dichotomy between speech/orality and writing/literacy. Ong defines Secondary Orality as "the orality of telephones, radio, and television, which depends on writing and print for its existence" (3). Ong could have included audio books in the purview of Secondary Orality, however, audio books are as absent from Ong's discussion of Secondary Orality as they are from Bolter's discussion of writing space. The supposition that Bolter was not discussing speech does not apply to Ong. But the second justification does apply, the supposition that audio books are not mainstream, so they do not merit the attention of academia.

It's true that discussion about audio books or speech technology is negligible in academic works, yet, some articles have managed to find room in a few mainstream books. Most notable for this dissertation will be the critique by Sven Birkerts in *Gutenberg Elegies*, which I will use to dispel some misconceptions about audio books. Before entering into a dialogue with Birkerts about technical issues with audio books, it will be worth commenting on his concerns about the sanctity of the book itself which he thinks is getting destroyed due to electronic and audio books.

As Bolter reminds us, "printed book as an ideal has been challenged by post-structuralist and postmodern theorists for decades, and now the computer provides a medium in which that theoretical challenge can be realized in practice" (3). The audio book does not threaten the structure of the book as severely as a computer does. The book has to be first produced in the conventional format before it gets converted in to audio format. Hence, audio books do not

threaten the conventional format of the book. On the contrary, they have helped conventional books by reviving interest in reading. This dissertation, it should be clearly stated, does not attempt to imply that one is better than the other. .

Audio books can help us deconstruct the notion of disabled, and expose the rupture and play in the structure and sign of ability/disability. Whereas the technology has helped the disabled overcome their disability, either partially or completely, the nondisabled, according to scholars, such as Katherine Hayles, are losing their ability to concentrate on reading, to calculate, and to memorize. They are being assisted by technology to these tasks. But we don't call that technology assistive technology, because the ideal signified for AT is linked only to those who fit the defined and fixed structure of disability.

Derrida and other post-structuralist writers deconstruct binary oppositions to debunk the view propounded by Saussurean structuralism that meaning comes from binary opposition. Derrida, in *Writing and Difference* for instance, disrupts the binaries of nature and culture established by the structuralist Levi-Strauss. Derrida uses the prohibition of incest and the oppositions nature/culture and universal/prescriptive to show that this structure can no longer withstand scrutiny: "The incest prohibition is universal; in this sense one could call it natural. But it is also a prohibition, a system of norms and interdicts; in this sense one could call it cultural" (283).

The opposition between mainstream and assistive technology can similarly be deconstructed with the example of Secondary Orality. Both disabled and non-disabled use the speech-based technology in their daily activities. Sighted people are increasingly listening to audio books and podcasts. Secondary Orality is also manifest on their GPS devices. Thus,

Secondary Orality is a common element in assistive and mainstream technologies, hitherto segregated by designers. The way the concept of ‘incest’ helps deconstruct binary opposition between Nature and Culture, Secondary Orality can be a deconstructing tool in the context of mainstream and assistive technology.

Debunking ‘logic of supplementarity’ is also essential for disrupting and deconstructing binary logic. We often hear teachers, pedagogues, and other academicians advocating supplementing of traditional education with audio/visual aids. Electronic books, audio books and hypertext are often suggested as supplements for reading of printed books. In Derrida’s view, to supplement something means to add to it in order to complete it. In other words the thing being supplemented needs completion. This kind of reasoning undermines the logic of binary opposition that is based on the concept of absence and presence.

As explained by Barbara Johnson in her article ‘Writing,’ published in *Critical Terms for Literary Study*, this is how the logic of supplementarity works:

A is added to B.

A substitutes for B.

A is a superfluous addition to B.

A makes up for the absence of B.

A usurps the place of B.

A makes up for B's deficiency.

A corrupts the purity of B.

A is necessary to that B can be restored.

A is an accident alienating B from itself.

A is that without which B would be lost.

A is that through which B is lost.

A is a danger to B.

A is a remedy to B.

A's fallacious charm seduces one away from B.

A can never satisfy the desire for B.

A protects against direct encounter with B.

The transformation that is underway in the preferred modes of reading confirms that the hierarchy in the relationship of 'A' and 'B,' as discussed above, is reversible. It can be reasonably said that what was supposed to be supplementing the traditional methods of reading and writing, seems to be more than a mere supplement. Electronic books are increasingly substituting, more than just supplementing the printed books. In other words, what was considered to be inferior, less-privileged, only for the print-disabled, is becoming mainstream. Alternative means of reading, I should emphasize again, was once meant only for the print-disabled.

Contrary to the concept of 'logocentrism' in Western metaphysics that Derrida critiques in *Of Grammatology* a blind person experiences ocularcentric bias all around, primarily in the academia. Martin Jay has investigated the ocularcentric bias in the 'enlightened' Western thinking in his *Downcast Eyes: The Denigration of Vision in Twentieth-Century French Thought*. I agree with Derrida's view that replacing one kind of bias with another kind would be tantamount to simply reversing the equation and reinforcing binary logic. As a result, I attempt not to apply the logic of supplementarity in this dissertation. The main goal of any

deconstructionist methodology is to destabilize the binary structure and the corresponding hierarchy altogether. This is what I aim to achieve from this dissertation.

Statement of Purpose

I intend to argue for desegregation of mainstream and assistive technology for the print-disabled by incorporating a speech-based interface into electronic gadgets and devices to ensure universal access. This measure can render impairment irrelevant, and disable the disability of visually challenged. I claim that Apple's approach towards accessibility be emulated by manufacturers of electronic devices and software to eliminate segregation between technology used by the mainstream and technology used by the print disable users. Integration in mainstream technology and other electronic spaces will be a giant leap towards overall integration of the blind in the mainstream.

To justify the need for a new theory, this dissertation exposes flaws in Universal Design (UD) and Universal Design for Learning (UDL) principles, and proposes an alternative theory of Universal Access. The concept of Universal Access is based on a nonvisual interface, primarily speech-based technology . I expand Walter Ong's concept of 'secondary orality' to all kind of literacy mediated by speech based technology. Audio books, podcasts, text-to-speech applications, voice recognition programs, and many such technologies are not directly discussed by Marshall McLuhan, Walter Ong, or many other theorists who predicted about technology's push towards orality. These technologies are examples of speech and literacy coming together to offer a new twist to the debate about speech and writing.

My dissertation challenges the effectiveness of UDL principles with a specific critique of the term ‘Universal’ which appears to be a contradiction of sorts. Inherent in UDL philosophy, for instance, is a challenge to “one design fits all” approach of teaching and learning (Meyer and Rose 9). However, UDL seems to be falling in the same trap of generalization that it theoretically challenges. Most of the proponents of UDL make their case based on a false premise that Assistive Technology is universally available and affordable, hence, the suggestion that teachers should provide reading material in multiple formats. There can be multiple reasons why that approach cannot work universally. The exorbitant cost of assistive technology, one of the primary concerns of this dissertation, is just one of them.

Moreover, UDL does not take in to account the scenario if and when the teacher, an essential pillar of the formal learning environment, has some sort of print disability. In other words proponents of UDL are not concerned if the technology in the classroom is not accessible to the teacher. The touch screen console used in classrooms at UCF (and in several other schools as well) do not figure in the UDL discourse. Thus, UDL allows perpetuation of discrimination, since it presupposes you are not expected to be a teacher if you are print-disabled.

Universal Design principles can be critiqued from the perspective of the residents of under-developed regions of the world. It is one thing to design products and services accessible to all, but the purpose gets defeated if the given product or service is not financially accessible (i.e. the targeted users cannot afford them.) Access will become significantly more affordable if speech-based technology is built in to the mainstream electronic gadgets and devices, rather than manufactured and sold separately as assistive technology. Theory of UD does not give

consideration to this important aspect of accessibility, falling far short of being universally applicable.

My dissertation enunciates the ways and means using which technology can be designed with built-in accessibility. With the example of Apple devices and Amazon's e-book reader Kindle, I emphasize how products can be designed so that blind and print disabled people can use them without having to buy any prohibitively expensive software. I demonstrate that the desirable technology to make devices universally accessible is already available, in certain devices it is incorporated into many electronic devices, and it is being used and appreciated by all kind of users; the designers just need to implement that technology in a way that people with disabilities can use them without any external assistance.

The term 'universal access' may sound inappropriate after critiquing the concept of UDL for it not being Universal. My aim will be to search methods to make every desirable technology accessible to people who have vision problems. While UDL usage of the term 'universal' is very broad, I intend to use it to denote universal access of technology for the print disabled. My theory of universal access focuses on speech-based technology, which ultimately can help people with all kinds of disabilities.

Scope and Limitations

The scope of this study is limited to a rhetorical conception of a post-disabled world where technology is universally accessible, and there is no ablist bias in social and electronic spaces. Even though technology has provided a level playing field for many under-served

sections of the society, we do hear about the problem of ‘digital divide’ in many academic discussions. People with disabilities, however, are hardly included in those discussions. This dissertation attempts to change that situation. Yet, there is no way to gauge the success of this endeavor. There is no way to know if this dissertation will succeed in bringing discussion about the constant othering of the disabled in the social and technological spheres to the academic mainstream.

This dissertation can be critiqued as to be trying to achieve contradictory goals. On the one hand it tries to bring forth the concerns of the disabled and argues for accessibility of technological spaces for everyone, on the other hand it rationalizes doing away with the concept of assistive technology, the very tool that has considerably benefited disabled individuals. I must add in defense of my argument that I approach this issue from the perspective of the Civil Rights Movement. Regardless of their obvious benefits, segregated schools cannot be acceptable in a society that calls itself civilized and enlightened. Assistive technology, in my view, is a segregated zone that has its benefits for the intended population; yet, because it encourages discrimination and segregation, it needs to be criticized and theorized from this alternative perspective.

The Disability Rights Movement in the US gave an impetus to the idea of equal access of disabled individuals to education, employment, buildings and services (Zames and Zames 11). This movement created consciousness about the issues of inaccessibility in various public and residential structures, which, in turn, lead to the concept of Universal Design. The dissertation includes a detailed description of UD and UDL along with a discussion on their limitations. This discussion about limitations of Universal Design theory serves to justify a more encompassing

theory of Universal access. The universality of this theory of Universal Access can be critically challenged. It is understandable that no theory applies universally. The same is true about my proposed theory of Universal Access. My dissertation acknowledges that criticism. Computers and cell phones, no matter how technologically accessible, will remain unaffordable (financially inaccessible) for many on the other side of the divide. Nonetheless, the concept of universal access is more desirable as the reach of this theory is intended to be wider than UDL. UDL, as established above, seems to address only rich individuals and resourceful institutions.

Universality of the concept of 'Universal Access' based on digital orality can also be challenged from the perspective of the speech impaired. Critiques may point out that speech based technology may help some disabled people but may end up alienating those who cannot speak and/or hear. I would like to address this concern with the example of the model followed by Apple Inc. in their IOS based devices. It is notable that iPhone, iPod Touch and iPad are able to understand gestures. As far as speech technology is concerned, these devices can convert speech in to text and text in to speech. Thus deaf people can communicate with others without using sign language. The text of other people speaking to them can be read on the screen and the text created by them can be heard or read by others by means of the IOS devices. Noted physicist Stephen Hawking, whose body is completely paralyzed now, has been using such a technology for communicating with the rest of the world for many years. But the technology he has been using is old, cumbersome, slow and expensive. The speech synthesizer he has been using cannot be replaced now as the manufacturer of that synthesizer has stopped producing those synthesizers. Hawking is not comfortable using any other communication device or speech synthesizer as he links the voice of his existing speech synthesizer with his own identity. Therein

lies the dilemma of dependence on technology, and argument for technological solution for the problem of disability. One fine day it ceases to exist and those relying on it find it difficult, if not impossible, to replace it.

Using the example of popularity of audio books, my dissertation demonstrates that audio technology, which was formerly designed to help the print disabled, is now being widely marketed to and being used by individuals who can read print on their own. Amazon's e-book reader, Kindle, is a mobile device that has significantly transformed the book industry. Amazon came up with a design that virtually transformed all electronic books into audio books. Kindle, in its new avatar, reads aloud electronic books in a synthesized voice which sounds like a natural human voice. Those who like to listen to books, rather than read them in print, can now easily afford to listen to books. Audio books, otherwise, are very expensive and therefore become inaccessible for many. One can already buy electronic books for a cheaper price than print books. Books are an essential part of learning, therefore, the theory of Universal access will encompass this aspect of accessibility as well. Despite the popularity of Kindle reader, and that of the audio books, college students are made to use print books. Their reading habits, as various surveys demonstrate, are on the decline. Katherine Hayles attributes this decline to the media rich environments that make sustaining attention for long time difficult.

Even though this dissertation argues that social and electronic spaces are becoming easily accessible to people with print disabilities, thanks to rise in popularity of digital orality, we are yet to see demonstrable improvement in the professional life of the disabled. The ablest bias cannot be eliminated just by the improvement in and glorification of the speech technology. The struggle for equal access to the disabled in all spheres of life needs to continue despite positive

signs emanating from the world of communication technology. The improvement in speech technology is a welcome news for people with print disabilities, yet the mainstream technology is always in the state of flux. Apple may come up with a new model for its communication devices that leaves out Voice Over. Several of IOS applications that previously worked with Voice Over have not remained accessible to Voice Over after they were upgraded. This dissertation is limited in that it assumes that speech based technology will not obsolesce and cede way for other inaccessible technologies.

We are living in the postmodern age, the age of convergence. With the example of iPhone I demonstrate how devices with multiple capabilities are causing multiple devices converge in to one. In fact, among technological gadgets cell phones in general offer a good example of convergence. The device that was invented to make telephone calls can now do almost everything that only our radio and computers could do earlier. Because cell phones are not as expensive as computers are, and because cell phones offer better connectivity than computers, cell phones will be more suitable to achieve the goal of Universal access of learning. The same kind of convergence, as I demonstrate in the second chapter, can be seen in theories.

At the level of Disability Theory, we primarily see a convergence between postmodernism, a mainstream theory, and Disability Theory (Corper and Shakespeare 2). I examine the salient features of critical theory many disability theorists borrow from. There is a wide variety of writers who write about disability from the perspective of postmodernism. Many others see common features in feminist theory. Writers have also analyzed disability from the point of view of Marxist and critical race theory's. Questions can be raised about a univocal theory of disability, when so many different disabilities and multiple disparate experiences exist.

The problem of agency is difficult, if not impossible, to resolve in a given discourse. However, despite differences, there are certain common concerns of people labeled as ‘disabled.’ It seems to be a universally accepted notion that disability invariably leads to abnormality. One of my goals in this dissertation is to deconstruct the binary of normality and abnormality, which, as I demonstrate in the dissertation, is not natural; it is socially and linguistically constructed.

Dissertation Outline

This dissertation is divided in four chapters, including this introductory chapter. Here is a brief description of the contents of each chapter that follows.

Chapter 2: Deconstructing Disability: Discourse on People without Reality to People without Corpo-Reality

This chapter explores the influence of critical theory, especially postmodernism, on disability discourse. The chapter reemphasizes the view prevalent in certain disability intellectual circles: disability is not a static condition. Fluidity and hybridity are the buzz words of the postmodern age.

The writings concerning disability, especially after World War II, were often sympathetic to the needs of disabled individuals. It invoked feelings of pity or ethics to get support, almost always financial, for those who could not fend for themselves. The writings demanding equal rights and legal protection for them were mostly based on the ideals of the Enlightenment but with no theoretical basis. This position generally held sway until Foucault

gave a new perspective for understanding disabling conditions as socially constructed and not necessarily inherent in a given physical condition. His genealogical investigation in to the making of the subaltern rendered the established concept of deviancy, abnormality, disability etc. defunct.

This chapter discusses some of Foucault's major texts to demonstrate how they inform and enrich disability discourse. Among his relevant major texts are:

- *Madness and Civilization* that describes the making and segregation of those considered insane;
- *The Birth of the Clinic* that shows scientific developments that rendered subjects' bodies passive, worth exercising control on;
- *History of Sexuality* that historicizes the systematic and discursive formation of the abnormal; and
- *Discipline and Punish* that presents a genealogy of methods used to transform those abnormal beings in to conforming and docile subjects.

Thanks to Foucault's influence and due to the influence of post-structuralist theories, disability has been theorized from a new perspective (Corper and Shakespeare 23; Goggin and Newell 11). Disability discourse now defines disability in two different ways, based on two different models. The first, which is consistent with a social model of disability and particularly popular within disability studies, involves making a distinction between disability and impairment. In this model impairment is defined as a form of biological, cognitive, sensory or psychiatric difference that is defined within a medical context, and disability is the negative social reaction to those differences. The rationale for this heuristic distinction is to separate the

experience of biological difference from the social/political/cultural prejudice, discrimination and other negative social experiences that many disabled people have to encounter.

The second prevalent definition of disability concerns issues of identity. In this context, disability, like race, gender or religion, is not necessarily regarded as a bad thing – it is an identity, with both social and personal dimensions, which may be associated with feelings of community, solidarity and pride, or conversely, with feelings of difference, exclusion and shame. A ‘disability identity’ is, as Mark Sherry suggests, not necessarily a medicalized identity – it could simply be an identity that is based on identifying as someone who navigates the world in atypical ways, facing many attitudinal and physical barriers.

The social causes of disability are several. Any discussion about them often remains within the bounds of disability studies. Academic works that theorize disability from the perspective of technology are rare if not nonexistent. Technology in relation to disability is discussed tangentially in some projects about UDL, but that kind of discussion is not comprehensive or sufficient to make a transformative impact. This chapter tries to fill that lacuna.

Given how the ‘body’ plays a major role in many works relating to disability discourse, the chapter borrows from Merleau-Ponty’s concept of ‘embodiment’ and Donna Haraway’s cyborg Manifesto. Haraway has used cyborg theory in regard to liberation of women, and this chapter attempts to apply the concept of cyborgs in relation to the discrimination against the disabled. Unfriendly conditions often disable people from functioning normally. When web developers, designers of software, or manufacturers of electronic goods and home appliances decide not to give consideration to people with special needs, they add to the disabling

environment. Attempts have been made, and are being made, at multiple levels to change that situation. Yet, the segregation and discrimination against people with disabilities is thriving. I propose my conception of a post-disability world where bodies will be irrelevant. It is not only the irrelevance of human bodies that can resolve the problem of inaccessibility of social and electronic spaces, this conception is merely a theoretical expansion of deconstructive approach in to the field of disability. In the subsequent chapters I present digital orality, ‘secondary orality’ in Walter Ong’s terms, as a solution to the accessibility related issues.

Chapter 3: Disabling Barriers, Inaccessibility of Electronic Spaces: The Role of Assistive Technology

I offer a historical overview of speech-based assistive technology designed for the blind in this chapter. The education of blind people was mostly based on rote learning, until Braille was invented. The process of converting reading material in Braille was very slow and cumbersome. Advances in audio recording technology and phonographs offered a new way for blind people to read. The National Library Service of the Library of Congress started using this audio technology for recording books in 1930s. Since then the audio books have gone through several phases of evolution.

Amazon’s Kindle e-book reader was a revolutionary device for the print-disabled as well as other readers. Kindle looked like a book and had dedicated buttons to change pages. Just like a book, and unlike computer and other electronic devices, it did not have its own light. This fact made reading experience on this device very similar to a print book.

The second version of Kindle, Kindle 2, was revolutionary for the print-disabled in the sense that it had its own screen reader that could convert text into speech. Once this screen reader was turned on, anybody could listen to a human sounding voice and access a book like an audio book. However, the menus were not read aloud so the blind and print-disabled could not turn the screen reader on their own. This fact established that Amazon was not thinking of print-disabled users when they planned a screen reader on Kindle. This description of accessibility/inaccessibility of Kindle reader serves as a good point for the discussion of inaccessible electronic spaces.

The chapter offers a detailed assessment of the problems regarding accessibility on various electronic spaces. It also discusses the problems print-disabled users face on the Web. I argue in favor of making webpages universally accessible. Access to websites is an essential condition to meet the basic requirement of Universal access. Flash, the program used very widely to design websites, can still not be used by the users of screen reading software. If a web designer is blind, his blindness becomes an obvious obstacle in his professional development.

Inaccessibility of webpages directly impacts the education of the print-disabled. Learning does not always have to be in conventionally designated places; it is increasingly happening in electronic spaces. However, access to such web-based resources is very limited to the print-disabled individuals (Schmetzke). Even today, when technology is in a very advanced stage, websites exist that cannot be read by a screen reading software. Print-disabled users, who depend on screen reading software to browse the Internet, cannot take advantage of services or information offered by such websites. The W3 consortium prepares guidelines for accessibility of websites but they are not always binding on designers and proprietors of websites.

Besides, these guidelines are not uniform across disabilities. Those with locomotor disabilities face different access challenges in the Cyber world, than those with visual challenges. A system where the user could give verbal commands to the computer and could receive the output verbally, would be universally accessible. People with all kind of disabilities would be able to use them.

It must be acknowledged, the situation could have been much worse in the absence of screen reading software. These software solutions speak out the information displayed on screen. Discussion about the screen readers connects us back to Ong's concept of Secondary Orality. Even though there are more than three proprietary screen-reading solutions available in the market, the price tag for each of them is three times more than the standard cost of a personal computer.

The problem of inaccessible electronic spaces is not restricted to websites. A lot of mainstream gadgets that can help in the process of learning are out of reach of the print disabled individuals. Electronic book readers, such as Amazon's Kindle, Barnes and Nobles' Nook, and Sony's e-book reader, are examples of some inaccessible but extremely useful devices. Due to inaccessibility of such devices, print disabled users remain bereft of the advantages of mobile ubiquitous technology available to general users for their reading needs. The next chapter discusses those devices with a business rationale of making them accessible to all potential users.

This chapter also defines Universal Design principles with a historical overview of the theory. The ideas of UD could not have existed in a vacuum, nor would the designers and architects have given heed to them if there was not a social movement going on demanding equal access of services for people with various disabilities. Conception of UD principles was a result

of some intellectually aware individuals who found a remarkable support from their disabled peers and from society in general (Fleischer and Zames 149-152).

It was the disability rights movement in the United States that made way for the idea of UD. A movement towards universally accessible design would have been considered audacious and utopian only a few years back. A small but significant movement can be traced back to the nineteenth century; it became more intense after the First World War. President Roosevelt was known to be disabled. This fact was very inspirational for the Disability rights activists who increased the intensity of the movement during his stay in the White House and made significant gains through their efforts (Fleischer and Zames 5-14).

World War II resulted in an unprecedented rise in the number of disabled individuals. Books, memoirs, and speeches of war-disabled individuals demonstrated to people in general that those who were willing to risk their life for the country were being subjected to live an inhumanly undignified life in the shelters. They had to survive on charity as there was no worthwhile employment for them. The stories of such disabled individuals brought sympathy and support for the movement from the public in general. The movement resulted in many favorable laws and significant court rulings siding with the viewpoint of the disability rights movement. A detailed outline of this movement and a detailed description of significant laws and court rulings that became remarkable milestones in the struggle for equal access for the disabled in the field of employment and education is not in the scope of this dissertation.

The discussion, after introducing the concept of Universal Design, moves toward the evolution of UD and UDL principles. The principles initially conceived to make buildings accessible were later then applied to products and services that disabled people could not use

(Bowe 20). Despite my critical approach towards it, I agree with the assertion that “UDL has been employed in various universities and colleges resulting in obvious benefits for people with disabilities (Burgstahler, Sheryl, and Cory 28).

As reflected in the literature on UD, the concept originates from the field of architecture, providing a framework for considering how products and environments can be designed to accommodate the broadest range of users (Bowe 13). Architect Ron Mace articulated seven principles of UD in the early 1970s (Bowe 15-19; Story et al. 98-103; The Center for Universal Design). First, equitable use confirms that the design is useful to people with diverse abilities. Second, flexibility in use assures that the design accommodates the widest range of individual preferences and abilities. Third, the design is simple, intuitive, and easy to understand by a wide range of users. Fourth, perceptible information assures that the design communicates information effectively to the user regardless of their abilities and needs. Fifth, a tolerance for error assures that the design minimizes hazards, consequences, and accidental actions. Sixth, low physical effort assures that the design can be used with minimum fatigue or discomfort. Finally, the seventh principle of size and space for approach and use assures access regardless of the individual's physical stature or capability.

Incorporating these principles at the very first stage of designing of products insures that they are designed with the flexibility to accommodate the broadest range of users from the beginning, rather than waiting to retrofit after the fact (Story et al. 104; The Center for Universal Design). These guiding precepts are as applicable to education as they are to architecture.

Universal design was initially conceived as a marketing theme: it took the idea of ‘accessibility’ (which carries connotations of disability and of government-mandated design

features) and presented it as something that appeals to all of us, in Bowe's words, "as an approach that we would elect to use because it responds to our enlightened understanding of diverse needs" (21).

The chapter concludes with a critical scrutiny of the UD and UDL principles. The problem with the existing theory of UDL is that it focuses only on making classroom instructions and reading material accessible, and it gives no consideration to people with limited means or schools subjected to the occasional (or chronic) resource crunch. UDL seems to perpetuate the stereotype by putting the disabled only on the less privileged side of the binary opposition, the sign that perpetuates binary oppositions. The disabled, in the established structure, are always only learners. UDL does not assume that a teacher can be blind as well.

I suggest that the reason behind the false perception of the designers of Kindle e-book reader, who thought that the device met the requirements of accessibility, was this limited view of accessibility propounded by the proponents of Universal Design. I list the basic principles of UD and demonstrate how Kindle can be said to be meeting all the requirements outlined in those principles. Hence, I believe, the blame for the inaccessible design of Kindle reader should go more to the limited view of Universal Design proponents, than to the manufacturers of the device.

Chapter 4: Orality and Universal Access

This chapter starts with a brief introduction to Walter Ong's concept of Orality and Literacy as illustrated in his famous treatise on this topic. More relevant for my research is Ong's

concept of ‘secondary orality,’ which, in his formation, has been brought into existence, and rapidly augmented by advances in digital technology.

Text to speech technology has given a new meaning to the concept of Secondary Orality. Ong’s concept of Secondary Orality entails a human voice reaching the audience electronically. This way of oral interaction is different from ‘primary orality’ where the oral interaction could happen only in a face-to-face environment.

The popularity of Secondary Orality has helped print-disabled individuals immensely. For example, the only way possible for a print disabled person to read a book previously was that a human being sat with him and read the book aloud. Thanks to digital technology, any kind of reading material, books, newspapers or other documents could be read aloud and recorded for print disabled users to listen to at a convenient time. Recorded books were a great boon towards educating blind students (Burgstahler, Sheryl, and Cory 65). With the increase in the devices with speech technology and text-to-speech, print-disabled people now can read the same books, at the same time and at the same price as their sighted peers.

With text to speech technology in such an advanced stage, human voice for reading has now become optional, if not redundant. Just like audio books, text to speech (TTS) technology was first used by the print disabled and then adopted by people in general. TTS technology has become so popular now that Amazon decided to include it in the 2nd version of their electronic book reader, Kindle. Popularity of TTS technology should be the reason that Microsoft should seriously think about producing computers with a built in screen reader. Apple has already done it; print disabled individuals are no longer required to buy an expensive screen reader to make use of new Apple products. The screen reader, I argue, will be used by sighted users as well as

by the blind and low vision users. Even though smaller mobile devices are set to replace laptops in the near future, it does no harm to anyone to build accessibility in the Windows operating system, as is the case with Apple's Mac computers.

This chapter includes a discussion on the welcome change in the policy of Apple Inc. All the recent products of Apple are accessible out of the box at no extra cost. Apple has been working hard to make their computers accessible to the print-disabled. Now they have incorporated VoiceOver (a text-to-speech function) into the touch-screen based iPhone, making it the only fully accessible wireless handset in the market.

Graphical User Interface (GUI) made Windows based computers very popular. Novice users found using computers very easy after GUI. But the millennial generation has become very proficient in using computers and computer based devices. They don't have to use the desktop icons anymore. It is high time to think about a new interface. Some experts have argued for NUI, the natural user interface where the computer operator gives commands by making specific gestures or by speaking aloud the commands. Apple has incorporated such an interface in many of their devices, including the iPhone, and with the incorporation of Siri Assistant on the latest version of iPhone, the interface has become more natural. Such an approach needs to be followed by Microsoft and designers of other electronic goods to ensure that the segregation between those who can read a screen and those who cannot is eliminated.

The use of Secondary Orality is increasing rapidly in this media-rich world. William Crossman thinks that speech based interface will replace the text-based interface completely very soon. In his *VIVO- Voice-in-Voice-out: The Age of Talking Computers* Crossman argues that the written word will exist no more by 2050. Our interaction with computers and computer based

devices will be natural, the way we interact with a living being. According to him four engines are driving us towards that situation:

1. Evolutionarily/genetically, humans are hard wired and driven to speak.
2. Technologically, humans are driven to develop technologies that allow us to access information by speaking and listening. Also, text/written language, being an ancient technology for storing and retrieving information, will get replaced - as do all technologies - by a newer technology that does the same job more efficiently, quickly, and universally.
3. Young people in the electronically-developed countries are, en masse, rejecting text as their technology of choice for accessing information in favor of speech-driven and non-text, visual-driven technologies.
4. The billions of functionally non-literate people worldwide want access to information, including the Internet and World Wide Web, without having to learn to read and write.

The written word will probably survive beyond 2050, but the way we access it may change significantly by that time. This chapter concludes with the claim that providing alternative access to their devices by nonvisual means does not only make legal and ethical sense for the manufacturers, it makes business sense as well. Statistics about iPhone sales demonstrate that devices offering nonvisual means of accessing the functions and text on the screen do better in market these days, than those sticking to their ocularcentric bias.

In addition to inaccessibility of such products and electronic devices, rapid advances in microchip and digital technology have led to increasingly complex user interfaces for everyday

products such as consumer electronics, home appliances, kiosks, and electronic office technology. Many new devices in these categories require interaction with visual displays, on-screen menus, touch screens, software, and other user interfaces that are inaccessible to people who are blind or have low vision. Settings on the stove, dishwasher, or home entertainment system are no longer controlled by knobs, switches, and buttons that can be easily discerned and readily identified. Inaccessibility of these devices is a major barrier to a blind person's independence and productivity. One doesn't have to be blind to complain about difficulty in using the touch-screen based interfaces on these appliances. Such an interface, however, disproportionately impacts a blind person. If a blind person cannot operate the interfaces of basic office equipment or software, such as copiers, fax machines, and basic word processing programs, that person's opportunity to join the workforce or maintain an existing job is in great jeopardy. This chapter will enunciate such barriers in the path to Universal access in the order stipulated above and end with possible alternative means of making these devices and equipment accessible. Many popular, cost-effective mechanisms are available for manufacturers to create interfaces usable through nonvisual means. For example, text-to-speech technology is inexpensive and more prevalent than it has ever been; it is used in everything from automated telephone systems to the weather forecasting service broadcast by the National Oceanic and Atmospheric Administration.

The key to accessibility out of the box is incorporating nonvisual access at the very design stage. Despite these accessibility solutions the majority of manufacturers have continued to design interfaces that do not include nonvisual means of use. The chapter concludes with reexamining the disabling aspect of technology which seems to have "inherent values built into

it, and those values actively operate to disable some people--those we call people with disabilities" (Goggin and Newell 27).

This dissertation considers multiple aspects of access barriers that apply to disabled, primarily blind and other print disabled individuals. My work addresses multiple stakeholders, including designers of technology, to ensure that blind and print disabled people are not discriminated against or segregated in the field of technology. Blindness may not always be cured, but disability that is caused by blindness has a technological solution. This chapter concludes with a summation of the technological solutions discussed in the previous chapters. I am optimistic that my dissertation will make readers aware about the problem of access and sensitive towards implementation of the principles of Universal Access as outlined in this dissertation.

CHAPTER TWO. DECONSTRUCTING DISABILITY: DISCOURSE ON PEOPLE WITHOUT REALITY TO PEOPLE WITHOUT CORPO-REALITY

Disability discourse is still in its infancy, yet it has assumed significant proportions as a propeller of change in the way ‘disability’ is viewed in society. Thanks to some significant work done in this field by scholars discussed in this chapter, namely Leonard Davis and Rosemary Garland, discussion about disability has started making room for itself in the ‘mainstream’ critical theory. It can be argued that Disability discourse is no more strictly of the disabled, for the disabled, and by the disabled. In this chapter I will deconstruct the binary opposition between mainstream critical theory on one hand and disability discourse on the other, by demonstrating the convergence between the two.

My main goal in this chapter is to deconstruct the ‘grand narrative’ of ‘disability.’ Because I am trying to present a postmodernist vision of disability, it will be worth inquiring the modernist understanding of disability first. Modernist ontology and epistemology have their roots in Enlightenment thought, which was responsible for the creation of many binary oppositions. My main focus will be to critique the binary of normal/abnormal. I will present an overview of the formation of the ‘normal in the enlightened world.’

I will start by discussing Michel Foucault’s influence on current Disability theory. Foucault’s critique of modernity can help us critically analyze the modernist vision of disability as well. The discussion then moves to some influential contributors to disability discourse. The scholars discussed here are influenced by Foucault, and they apply Foucaultian method of ‘genealogy’ in context of disability discourse. A discussion about their major work will help us

understand disability theory, its scope and concerns, in a fruitful way. I will conclude this chapter with a conception of a post-disabled world. This conception is inspired by the conception of a posthuman world conceived of by some feminist scholars, such as Katherine Hayles and Donna Haraway. My attempt will be to establish that in the age of cyborgs there is no difference between a disabled and an able-bodied person.

The terms ‘disabled,’ ‘disability,’ ‘able-bodied,’ ‘mainstream,’ – and their counterparts in other languages -- are all problematic. I believe that they perpetuate the ablist bias through language. Yet, for the lack of mutually agreed alternatives in the language, and in order to avoid any confusion by the use of alternative terms, I will keep using them throughout the dissertation. Yet, they will always be used as if they were within quotation marks.

I will use the term ‘discourse’ to denote the level on which the object of this inquiry is located. Martin Jay defines ‘discourse’ as “a corpus of more or less loosely interwoven arguments, metaphors, assertions, and prejudices that cohere more associatively than logically in any strict sense of the term.” Discourse in this usage is explicitly derived from the Latin *discurrere*, which means a running around in all directions. The discourse that I hope to examine and add to is precisely that: “an often unsystematic, sometimes internally contradictory texture of statements, associations, and metaphors that never fully cohere in a rigorous way” (Jay 15).

Foucault, on Formation of ‘Abnormal’ Subjects and Construction of a ‘Disabled’ Body

Foucault’s work is very significant to understand and to establish that disability is a social and linguistic construction. Many scholars have demonstrated that his analyses of medicine, madness, and discipline and punishment have relevance to the experiences of the

disabled. In his *The Birth of the Clinic* Foucault argues that “the patient, the madman and the criminal are constructed through disciplinary techniques, for example, the ‘medical gaze’” (29). Before Foucault’s writings influenced the discourse on disability, disability activists had been producing works pointing towards and challenging the discrimination against people with disabilities. These writings were mostly based on the ideals of Enlightenment thought which consider disability a result of an impairment in the body. Foucault gave a new perspective for understanding disabling conditions as socially constructed and not necessarily inherent in a given physical condition. His genealogical investigation in to the making of the subaltern rendered the established concepts of deviancy, abnormality, and disability, defunct.

In the following paragraphs I will discuss some of his major texts and demonstrate how they inform and enrich our understanding of disability. Among his relevant major texts that have bearing on the present study:

- *Madness and Civilization* that describes the making and segregation of those considered insane;
- *The Birth of the Clinic* that shows scientific developments that rendered subjects’ bodies passive, worth exercising control on;
- *History of Sexuality* that historicize the systematic and discursive formation of the abnormal; and
- *Discipline and Punish* that presents genealogy of methods used to transform those abnormal beings in to conforming and docile subjects.

Foucault did not consider himself post-structuralist, yet his work is significant for its post-structuralist analyses of madness, criminality, sexuality, ‘biopolitics’ and power (Corker 7).

The possible Foucaultian perspective on disability might suggest that a proliferation of discourses on impairment gave rise to the category 'disability'. Though these discourses were originally scientific and medical classificatory devices, they subsequently gained currency in judicial and psychiatric fields of knowledge.

Foucault's main interest is in the ways in which individuals are constructed as social subjects, knowable through disciplines and discourses, and 'to create a history of the different modes by which, in our culture human beings are made subjects'. The effects of the mechanisms of power, he contends in "Subject and Power," are to construct individuals as subjects in two senses: as subject to someone else, through control and restraint, and as a subject tied to their own identity by their conscience and self-knowledge. "Both meanings suggest a form of power which subjugates and makes subject to" (212).

Numerous disabled individuals stop believing in their own potential when they constantly face disabling environments. Many are told by their school counselors that they won't be able to go for higher education. Many are told by recruiters that they may not be an appropriate candidate for the job because of their physical limitations. I have encountered job vacancy advertisements where "acceptable eyesight" is stated in the list of requirements, even for jobs where sight is not required at all. As a result of such stereotypes, many disabled subjects stop looking for gainful employment and depend completely on the Social Security money offered to them by the government. Such people exemplify the process of turning in to a disabled subject from a disabled individual. The power that brings that transformation in to them, in my opinion, is the power of ablist bias.

Foucault helps us discover the genesis of the discourse that leads to the formation of, what I call, a disabled subject. In *The Birth of the Clinic* and *Madness and Civilization*, Foucault traces changes in the ways in which physical and mental illness or abnormality were discussed. Foucault employs a distinctive methodology for these studies, archaeology, which aims to provide a “history of statements that claim the status of truth” (Davidson 221). In his later work, *Discipline and Punish*, Foucault focuses on the techniques of power that operate within an institution and which simultaneously create ‘a whole domain of knowledge and a whole type of power’ (185). This work is characterized as genealogy and examines the ‘political regime of the production of truth’ (Davidson 224).

One of the prevalent Foucaultian themes in disability discourse is the way in which the ‘gaze’ constructs individuals as both subjects and objects of knowledge and power. In *The Birth of the Clinic*, Foucault illustrates how the medical gaze opened ‘a domain of clear visibility’ (105) for doctors by allowing them to construct an account of what was going on inside a patient and to connect signs and symptoms with particular diseases. The space in which the gaze operated moved from the patient's home to the hospital.

This became the site for the teaching, as well as the acquisition of medical knowledge, the object of which was the body of the ill patient. The body of the madman, according to Foucault in *Madness and Civilization*, was viewed as ‘the visible and solid presence of his disease’. Hence, the medical gaze focused on the body and ‘normalization’ or treatment of the insane involved ‘consolidation’, ‘purification’, ‘immersion’ or ‘regulation of movement’ (159-72).

Even though Foucault illustrates normalizing practices in most of his writings, he didn't write a full length book on the concept of disability. Yet, in *Madness and Civilization* he outlines the systematic othering and segregation of the mentally challenged citizens in France at the end of 16th, 17th and 18th century. The segregated zones for such people came in to being, Foucault writes, only after the number of lepers dwindled. In other words, before the discourse made some people so, the mentally challenged people either did not exist or were not different enough to be quarantined. As the madman had replaced the leper, the mentally ill person was now a subhuman and beastly scapegoat; hence the need to protect others.

Edith Kurzweil writes in *The Age of Structuralism: Levi-Strauss to Foucault*, "Foucault writes about the language of madness as language that appeared when leprosy disappeared. For example, the mad in the Middle Ages were actually put on ships—ships of fools—and excluded from society, in effect purifying society and creating social solidity."

In *Madness and Civilization* Foucault links madness to society's language of binary opposites, in this case the mad and the sane. Excluding the mad was symbolic of the need for signs to signify or match that to which they pointed. The signifier and the signified were agreed upon in an unconscious manner, and in a similar unconscious manner, language was assumed to actually represent what it named. By creating the signs and then enforcing them, man was subject to his own words (Kurzweil 51).

Foucault's genealogy project, as undertaken in *The Birth of the Clinic*, informs that it was in the late 18th century that the conditions that gave rise to the modern conception of the body came in to existence. In that historical context, the modern body was created as the effect and object of medical examination, which could be used, abused, transformed and subjugated.

As Shelley Tremain points out, the doctor's patient had come to be treated in a way that had at one time been conceivable only with cadavers. The passivity of this object resulted from the procedure of clinical examination, where the investigative gaze fixed and crystallized as 'the body' that which it perceived. "Clinical descriptions elaborated in the course of these examinations constituted new objects of knowledge and information, created new realities and introduced new, inescapable rituals into daily life, rituals whose participants became epistemologically dependent on the newly created objects" (Foucault 112).

He further demonstrates, in *The Birth of the Clinic*, how the treatment of the body as a thing paralleled, and worked in concert with, the 'dividing practices' (212) which were instituted in the nineteenth century clinic's segregated zone. As Shelly Tremain explains, "Foucault uses the term 'dividing practices' to refer to those modes of manipulation through which a science (or pseudo-science) is combined with practices of segregation and social exclusion: dividing practices categorize, distribute and manipulate subjects who are initially drawn from a rather undifferentiated mass of people" (25).

Foucault argues, in *History of Sexuality*, that this objectification of the body in eighteenth-century clinical discourse was one pole around which a new regime of power -- biopower —coalesced. This form of power, suggests Foucault in "The Subject and Power," applies itself to immediate everyday life which categorizes the individual, marks him by his own individuality, attaches him to his own identity, imposes a law of truth on him which he must recognize and which others have to recognize in him. It is a form of power which makes individuals subjects (212).

As enunciated in *The Birth of the Clinic*, clinical discourse established the dividing practices to differentiate normal bodies from defective/disabled bodies. Such distinction necessitated an army of experts, doctors, psychiatrists, therapists, rehabilitation specialists, and many other institutions that were supposed to be in paternal relationship with those deemed as disabled bodies.

This army of experts that carries forward the ‘dividing practices,’ and in turn helps in formation of a disabled subject, is precisely what the organized disability movements and advocacy organizations have been skeptical about. Similarly, disability theorists influenced by postmodernism and post-structuralism find themselves at odds with this paternalistic relationship between the ‘experts’ and the disabled subjects.

As stated above, it was the influence of Foucault’s work that changed the way disability was regarded in general, a sheer consequence of a physical condition. Disability scholars and disabled individuals realized that disability was socially constructed. As the feminist theorists with the advent of post-structuralism discovered a difference between ‘sex’ and ‘gender,’ disability theorists started making a clear distinction between impairment, a clinical condition, and disability, caused by unfriendly environment. Disability discourse now defines disability in two different ways, based on two different models. The first, which is consistent with a social model of disability and particularly popular within disability studies, involves making a distinction between disability and impairment. In this model impairment is defined as a form of biological, cognitive, sensory or psychiatric difference that is defined within a medical context, and disability is the negative social reaction to those differences. The rationale for this heuristic distinction is to separate the experience of biological difference from the social/political/cultural

prejudice, discrimination and other negative social experiences that many disabled people go through.

The second prevalent definition of disability concerns issues of identity. In this context, disability (like race, gender or religion) is not necessarily regarded as a bad thing – it is an identity, with both social and personal dimensions, which may be associated with feelings of community, solidarity and pride, or conversely, with feelings of difference, exclusion and shame. As Mark Sherry opines, “A ‘disability identity’ is not necessarily a medicalized identity – it could simply be an identity that is based on identifying as someone who navigates the world in atypical ways, facing many attitudinal and physical barriers.”

Organizations formed by disabled activists have used the identity model of disability to draw and retain members in their folds. At the time of their foundation, though, they are primarily concerned with the social model of disability. Such organizations challenge the passive subservient status allowed to the disabled by the institutionalized army of disability experts. As Helen Liggett argues, “It is necessary to become conscious of the institutionalized practices in terms of which disability is constituted” (264) in order to broaden the scope for political action. “Nothing about us without us” is the common theme of these organizations. They argue that without the involvement of the disabled individuals themselves, the established myths, stereotypes, and the misnomers will shape the disability discourse. The National Federation of the Blind, for instance, is such an organization that has consistently pointed towards the misconceptions and misperceptions in the way the ‘experts’ think about the blind people.

In this context, it will be worthwhile mentioning a speech by former president of National Federation of the Blind (NFB) that ridicules the expert organization, American

Foundation of the Blind (AFB), for a manual written by them to teach blind individuals and their care givers the tips of personal management.

One may note that the prepositions ‘of’ and ‘for’ in the names of these organizations indicate divergence in the way these organizations view and advocate blindness related issues. The American Foundation for the Blind is an organization of experts instituted by the government for the welfare of the blind. The National Federation of the Blind, on the other hand, is an organization formed by blind individuals for the purpose of advocating from the perspective of the blind.

‘Experts,’ in NFB’s view, relegate the disabled to a mere object of knowledge, without any agency. Especially notable in this speech is the erroneous information the experts seem to have about the practical knowledge blind persons are capable of possessing without being taught:

“I have already spoken about R and D—the so-called ‘research and demonstration’—financed ever more heavily and lovingly by the Department of Health, Education, and Welfare. I have at hand a typical product of R and D—a comprehensive 239-page publication of the American Foundation for the Blind, entitled A Step-by-Step Guide to Personal Management for Blind Persons.”

Dr. Jernigan, then president of NFB, takes his listeners through various steps described in the manual for a sponge bath. Subsequently he comments more emphatically on two of the steps that blind people would find especially demeaning, questioning their basic commonsense.

“Disrobe and place clothing where it will not get wet.” What does it tell us about the intelligence—the presumed intelligence—of the blind person under instruction? It tells us that he has not the sense to come in out of the rain; or, more exactly, that he has not the sense to bring

his clothes in out of the shower. He is presumed to be either a mental case or a recent immigrant from the jungle, who has never taken a bath before. This latter possibility is given additional credence by instruction number fifteen: “As towel gets damp, shift to a dry section.” If the trainee has ever bathed before, he will know about that. Only if he is a babbling idiot or Bomba, the Jungle Boy, does he need to be given that extraordinary advice. This presumption of incompetence or newborn innocence on the part of the blind person is, indeed, pervasive of the entire 239-page guidebook.

“What else can it mean to say, with regard to the technique for shaking hands: “If desired, the hands may be moved in an up and down motion?” What else can it mean to say, with regard to the technique for nodding the head: “The head is held facing the person to whom you wish to communicate ... With the head held in this position, move the chin down towards the floor about two inches then raise it again to the original position. Make this movement twice in quick succession.””

Elsewhere in the speech, Dr. Jernigan demonstrates how the expert teachers of the blind consider the method of using Braille inferior to the method used by the people on the other side of the ability divide, in this case the sighted students.

“I had occasion recently to visit a public school where there was a resource class for blind and partially seeing children. The teacher moved about with me among the students. “This little girl can read print,” she said. “This little girl has to read Braille.” Now, that language is not oppressively bad. Its prejudice is a subtle thing. But just imagine, if you will, a teacher saying of a pair of children: “This little girl can read Braille; this little girl has to read print.” The supposition is that the child possessing some sight, no matter how little, is closer to being a

normal and full-fledged human being; the one without sight can't cut it and has to make do with inferior substitutes.”

To sum up, Foucault offers valuable insights to enrich the discourse on disability. He establishes that ‘normality’ and ‘abnormality’ are both linguistically constructed and that a change in social environment may make a disabled as fit as an able-bodied individual. When such a realization dawns on the society, disability can be eradicated. Impairment will still exist but it will not disable impaired people from participating in day to day activities. Foucault’s critique of Enlightenment thought, and his enunciation about ‘normal’ being a construction of discourse, has been brought to bear by some disability scholars. In the next section of this chapter I will discuss two of those scholars who critique the ideal of ‘normality.’ Many other scholars have made remarkable contribution in this field, but in the interest of time and space I am leaving them out of this discussion.

Lennard J. Davis

In addition to being a great scholar in English and American literature, Leonard J. Davis is a significant figure in disability theory. Even though his work mainly concerns deafness related issues, he has contributed significantly about Enlightenment thought vis-a-vis blindness related issues. In his first major work entitled *Enforcing Normalcy: Disability, Deafness and the Body*, Davis discusses Enlightenment and disability in detail. His major concerns in relation to Enlightenment are to do with the concept of perfect human being, normalcy, modern world’s

obsession with placing human beings in to various categories, and marginalization of people who are different from the norm.

In *Enforcing Normalcy: Disability, Deafness and the Body* Davis presents a historical overview of discrimination against and oppression of the disabled. The epigraph for this book is borrowed from Aristotle's *Politics*, a big contributor to Enlightenment thought. Aristotle is quoted as saying, "As for the exposure and rearing of children, let there be a law that no deformed child shall live." The practice of exposure was commonplace in the Greco-Roman world. Plato also endorsed the practice in *Theaetetus*.

Yet, as Cynthia Patterson cautions in her *Not Worth the Rearing*, we should not be too quick in reading a modern Eugenic intent into Aristotle's remark. "Certainly, the ancients knew nothing of modern genetic science. The Greek notion of exposure was complex and multifaceted. Some practiced it as a means of selecting the sex of their children, others to limit the size of their families, and still others in response to actual or perceived deformity" (105).

One of the corollaries of Enlightenment thought was singular privileging of the sense of sight, denigrating the other senses completely. Davis discusses a short story by John Varley in the Introduction to *Enforcing Normalcy* to highlight the sense of touch. Published in 1978, this story presents a New Mexico Utopian commune in the 1990s, which the narrator names 'Keller.' It is not incorrect to assume that the Keller commune is named after the legendary disabled figure Helen Keller. The adult members in this commune are deaf and blind survivors of a rubella epidemic from the 1960s, yet their children are sighted and hearing. The adults communicate with their children through finger spelling and through what is termed 'Touch.' Davis explains that Touch is:

A deeper kind of communication is achieved through physical contact of naked bodies. Blindness when combined with deafness necessitates touch. Touch, as Varley makes clear, is very underutilized in an aural/oral/visual world. “The line between the sexual and the nonsexual, between heterosexuality and homosexuality, is erased, since all body contact is a form of talk, and everyone talks with everyone. Touch is itself a metalanguage, a language beyond language” (20).

Sense of touch has been integral to many blind people’s education, as Braille has been the primary medium of educating the blind ever since it was accepted as the legitimate medium in mid-19th century. I will discuss touch and other nonvisual means of accessing information in detail in chapter 3 of this dissertation. Coming back to Varley’s story, it can also be read as a response to the common belief that the disabled are asexual beings, that they do not have a healthy sexual life. This assumption is rooted in the Enlightenment idea of the human body which is not complete without the sense of sight and hearing. It is notable that Helen Keller, after whom this commune is named, has been a subject of discussion in various writings regarding her sexuality. A detailed discussion on Keller, or disabled people as sexual beings is not in the scope of this dissertation.

The fact that this story can help establish that the Enlightenment has both favorable and unfavorable elements for disabled people, is very much relevant to this dissertation. The founding principles of the commune, as described by Varley's narrator, remind us of the Enlightenment precepts of *tabula rasa* and rejection of universal moralism:

“They had no clearer idea of what their society would be than anyone else. They had been forced [in their former lives in hospitals and ‘special schools’] into a mold that was not

relevant to their needs, but beyond that they did not know. They would search out the behavior that made sense, the moral things for deaf-blind people to do. They understood the basic principles of morals: that nothing is moral always, and anything is moral under the right circumstances. It all had to do with context. They were starting with a blank slate, with no models to follow” (Varley 287).

As the title of the book, *Enforcing Normalcy*, implies, the concept of the ‘norm’ and ‘normalcy’ plays a big role in Davis’s writings. He finds the concept of the ‘norm’ in Enlightenment thought. He acknowledges that “some concept of the norm has always existed.” Yet, he claims, “the social process of disabling arrived with industrialization and with the set of practices and discourses that are linked to late eighteenth- and nineteenth-century notions of nationality, race, gender, criminality, sexual orientation and so on” (24). I will present a detailed overview of the genesis of the idea of ‘normality’ later in this chapter.

Rosemary Garland-Thompson

Rosemary Garland-Thompson has changed the disability discourse in a number of ways. She borrows many ideas from feminist theory and applies them on disability theory to analyze and reinterpret disability. Her first major work is *Extraordinary Bodies: Figuring Physical Difference in American Culture and Literature* in which she takes aim at many Enlightenment concepts. She demonstrates how disability, like feminism, takes part in “postmodernism's challenge of the unsituated, objective Enlightenment viewpoint” leading to a “complex, dynamic

matrix of interrelated, often contradictory, experiences, strategies, styles, and attributions mediated by culture and individual history” (24).

Garland-Thompson investigates how representation attaches meanings to bodies. “Although much recent scholarship explores how difference and identity operate in such politicized constructions as gender, race, and sexuality.” She argues that cultural and literary criticism has generally overlooked the related perceptions of ‘corporeal otherness’ (5). ‘Corporeal otherness,’ she explains, has also been referred to in the past analyses variously as, ‘monstrosity,’ ‘mutilation,’ ‘deformity,’ ‘crippledness,’ or ‘physical disability.’ She claims that the physically extraordinary figure these terms describe is as essential to the “cultural project of American self-making as the varied throng of gendered, racial, ethnic, and sexual figures of otherness that support the privileged norm” (5).

In her *Extraordinary Bodies*, one of Garland-Thompson’s major aims is to challenge entrenched assumptions that ‘able-bodiedness’ and its conceptual opposite, ‘disability,’ are self-evident physical conditions. In Foucaultian vein, she reconceptualizes these identity categories by disclosing how the ‘physically disabled’ are produced by way of legal, medical, political, cultural, and literary narratives that comprise an exclusionary discourse. “Constructed as the embodiment of corporeal insufficiency and deviance, the physically disabled body becomes a repository for social anxieties about such troubling concerns as vulnerability, control, and identity” (6). In other words, she relocates disability from the realm of medicine, where it has traditionally been confined, into that of political minorities, “to recast it from a form of pathology to a form of ethnicity.” She also counters the accepted notions of physical disability as an absolute, inferior state and a personal misfortune, and demonstrates that disability is, rather,

“a representation, a cultural interpretation of physical transformation or configuration, and a comparison of bodies that structures social relations and institutions” (9). Disability, then, as Rosemary Garland-Thompson recasts it, is the attribution of corporeal deviance – “not so much a property of bodies as a product of cultural rules about what bodies should be or do” (9).

She introduces a new term relevant to disability study, ‘normate,’ a neologism that signifies the privileged few. Explaining the term Garland says, “Normate, then, is the constructed identity of those who, by way of the bodily configurations and cultural capital they assume, can step into a position of authority and wield the power it grants them. If one attempts to define the normate position by peeling away all the marked traits within the social order at this historical moment, what emerges is a very narrowly defined profile that describes only a minority of actual people” (8).

The work of the noted sociologist Erving Goffman can be very enriching for the scholars who want to scrutinize and subvert the entrenched notion of disability. Garland-Thompson has discussed his ‘Stigma’ theory in detail in the context of the formation of ‘normate’ beings. Goffman, notably, observed in relation to ‘stigma’ that there is “only one complete unblushing male in America: a young, married, white, urban, northern, heterosexual, Protestant father of college education, fully employed, of good complexion, weight and height, and a recent record in sports” (8). Those who do not fit that profile, Garland-Thompson suggests, live with the stigma of being different, and they invariably face disabling environments many times in their life time.

Metaphysics of Normalcy

As discussed above, disability writers and activists do not find anything inherent in one's physical condition that can justify privileging or marginalizing of a given individual. There is something inherent in Western thought, as Jacques Derrida argues, which leads to such a bias. Such a dichotomous difference of treatment – between those who have everything required to be considered 'normal' on one hand, and those who deviate from the 'norm' on the other – is nothing but arbitrary, in Derrida's view. Metaphysics of presence, which is also referred to simply as 'Metaphysics,' is a potent strategy of deconstruction that Derrida applies in his analyses deconstructing binary oppositions. For deconstructing the binary of Ability/Disability, Metaphysics can play an essential role as well.

In the 'Afterword' to *Limited Inc.*, Derrida suggests that metaphysics can be defined as: "The enterprise of returning 'strategically,' 'ideally,' to an origin or to a priority thought to be simple, intact, normal, pure, standard, self-identical, in order then to think in terms of derivation, complication, deterioration, accident, etc. All metaphysicians, from Plato to Rousseau, Descartes to Husserl, have proceeded in this way, conceiving good to be before evil, the positive before the negative, the pure before the impure, the simple before the complex, the essential before the accidental, the imitated before the imitation, etc. And this is not just one metaphysical gesture among others, it is the metaphysical exigency, that which has been the most constant, most profound and most potent" (236).

In this context, 'ability' is the position which Derrida identifies as, "a priority thought to be simple, intact, normal, pure, standard, self-identical." Conversely, 'disability' is impure, abnormal, an aberration. Hence, disabled people are not considered to be normal in the West, or

anywhere else in the world. There is no second opinion about the fact that disabled people feel discriminated against in all spheres of life. The way many other categories of people feel that the ideals of 'equality' apply, in practical terms, only to those who belong to the privileged side of the binary opposition, people with some kind of disability have that realization pretty early in life. They have to undergo hardships in their regular routine as everything in the world, in general, has been designed in a way that reflects an ablist bias. The disabled are disabled because they deviate from the standard or 'norm.'

To understand the disabled body, then, one must investigate the concept of the norm, or the normal body. Leonard Davis has thrown some light on construction of 'normalcy.' Even though most of the writing about disability has focused on the disabled person as the object of study, Davis focuses not so much on the construction of disability, as on the construction of normalcy. This approach is more useful because, as we discussed above, the 'problem' is not the person with disabilities; the problem is branding of the disabled as 'abnormal.' Such labeling encourages 'othering' or segregation from the mainstream.

Even though one would assume that some concept of the norm must have always existed, as Davis exposes, the social process of disabling arrived with industrialization and with the set of practices and discourses that are linked to late eighteenth- and nineteenth-century notions of nationality, race, gender, criminality, sexual orientation, and so on. The relevant terminology surrounding this concept -- 'normal,' 'normalcy,' 'normality,' 'norm,' 'average,' 'abnormal' -- all entered the European languages rather late in human history. The word 'normal' with its current signification of "constituting, conforming to, not deviating or different from, the common type or standard, regular, usual," only enters the English language around

1840. Prior to that the word had meant ‘perpendicular’; the carpenter's square, called a ‘norm,’ provided the root meaning. Likewise, the word ‘norm,’ in the modern sense, has only been in use since around 1855, and ‘normality’ and ‘normalcy’ appeared in 1849 and 1857, respectively. If the lexicographical information is relevant, it is possible to date the coming into consciousness in English of an idea of “the norm” over the period 1840 1860 (9).

The concept of ‘normal’ was preceded by the concept of the ‘ideal.’ The idea of ‘ideal’ envisages “a mytho-poetic body that is linked to that of the gods (in traditions in which the god's body is visualized)” (10). This divine/ideal body is not attainable by a human. When ideal human bodies occur, they do so in mythology. So Venus or Helen of Troy, for example, would be the embodiment of female physical beauty.

Davis offers ‘grotesque’ to contrast with ‘Ideal.’ In other words, if ‘disabled’ body is in binary opposition to ‘normal’ body, ‘grotesque’ body was in dichotomous relationship with ‘ideal’ body. The grotesque as a visual form “was inversely related to the concept of the ideal and its corollary that all bodies are in some sense disabled” (10). In that mode, Davis suggests, the grotesque is a signifier of the people, of common life. However, it will not be fair to equate grotesque with the disabled. It is impossible to think of people with disabilities now being used as architectural decorations as the grotesque people were on the facades of cathedrals throughout Europe. “Whereas the disabled body, a later concept, was formulated as by definition excluded from culture, society, the norm, the grotesque permeated culture and signified common humanity” (12).

It is worth exploring where the concept of ‘norm,’ that found its way in to Western culture only in the nineteenth century, came from. Davis suggests, “One of the logical places to

turn in trying to understand concepts like ‘norm’ and ‘average’ is that branch of knowledge known as statistics” (11). According to Theodore Porter, statistics begins in the early modern period as ‘political arithmetic’ a use of data for “promotion of sound, well-informed state policy” (Porter 18). The word ‘statistik’ that was first used in 1749 by Gottfried Achenwall, in the context of compiling information about the state, moved from the state to the body when Bisset Hawkins defined medical statistics in 1829 as “the application of numbers to illustrate the natural history of health and disease” (Porter 24).

In France, statistics were mainly used in the area of public health in the early nineteenth century. It was the French statistician Adolphe Quetelet (1796-1847) who contributed the most to a generalized notion of the normal as an imperative. He noticed that the “law of error,” used by astronomers to locate a star by plotting all the sightings and then averaging the errors, could be equally applied to the distribution of human features such as height and weight. He then took a further step of formulating the concept of “l’homme moyen” or the average man. According to Porter, Quetelet maintained that this abstract human was the average of all human attributes in a given country. For the average man, Quetelet wrote in 1835, “all things will occur in conformity with the mean results obtained for a society. If one seeks to establish, in some way, the basis of a social physics, it is he whom one should consider ...” (Porter 53).

Quetelet's average man was a combination of ‘l’homme moyen physique’ (physically average), and ‘l’homme moyen morale’ (morally average). In formulating the idea of l’homme moyen, Quetelet also provided a justification for les classes moyens, an average class. “With bourgeois hegemony comes scientific justification for moderation and middle-class ideology.

The average man, the body of the man in the middle, becomes the exemplar of the middle way of life” (Porter 101).

Similar progression towards ‘bourgeois hegemony,’ the middle way of life, can be seen extolled in English novels as well. The statement in *Robinson Crusoe* in which Robinson's father extols middle-class life as a kind of norm is a good example of this ideology:

The middle Station had the fewest Disasters, and was not expos'd to so many Vicissitudes as the higher or lower Part of Mankind; nay, they were not subjected to so many Distempers and Uneasiness either of Body or Mind, as those were who, by vicious Living, Luxury and Extravagancies on one Hand, or by hard labor, Want of Necessaries, and mean or insufficient Diet on the other Hand, bring Distempers upon themselves by the natural consequences of their Way of Living; That the middle Station of Life was calculated for all kinds of Vertues and all kinds of Enjoyments; that Peace and Plenty were the Hand-maids of a middle Fortune; that Temperance, Moderation, Quietness, Health, Society, all agreeable Diversions, and all desirable Pleasures, were the Blessings attending the middle Station of Life (Defoe 6).

In other words, the average becomes paradoxically a kind of ideal, something strongly desired. Porter quotes Quetelet claiming, “an individual who epitomized in himself, at a given time, all the qualities of the average man, would represent at once all the greatness, beauty and goodness of that being” (102).

One may feel tempted to encase the dichotomy of average/abnormal in the Marxian framework of haves/have nots. After all, Marxian ideology completely debunks the privileged position of the average Bourgeois haves, and argues for a revolution by the Proletarian have nots. However, it will be worth noting, even Karl Marx has given credence to Quetelet's concept of

the average in some his writings. For instance, Marx cites Quetelet's notion of the average man in a discussion of the labor theory of value. Davis suggests that one of the most powerful ideas of Marx, the notion of labor value or average wages, in many ways is based on the idea of the worker constructed as an average worker. In *Capital*, one of his renowned treatises, Karl Marx supports the concept of average worker in the following words:

Any average magnitude, however, is merely the average of a number of separate magnitudes all of one kind, but differing as to quantity. In every industry, each individual laborer, be he Peter or Paul, differs from the average laborer. These individual differences, or 'errors' as they are called in mathematics, compensate one another and vanish, whenever a certain minimum number of workmen are employed together (Marx 323).

The concept of a norm, unlike that of an ideal, implies that the majority of the population must or should somehow be part of the norm. So, with the concept of the norm comes the concept of deviations. When we think of bodies, in a society where the concept of the norm is operative, then people with disabilities will be thought of as deviants. This, as we have seen, is in contrast to societies with the concept of an ideal, in which all people have a non-ideal status (Davis 13).

The use of statistics began an important movement, and there is a telling connection between the founders of statistics and their larger intentions. An amazing fact that Davis draws attention towards is that almost all the early statisticians had one thing in common: they were eugenicists. The same is true of key figures in the movement: Sir Francis Galton, Karl Pearson, and R. A. Fisher. While this coincidence seems almost too striking to be true, we must remember that there is a real connection between figuring the statistical measure of humans and then

hoping to improve humans so that deviations from the norm diminish as someone like Quetelet had suggested. Statistics is bound up with eugenics because the central insight of statistics is the idea that a population can be normed. An important consequence of the idea of the norm is that it divides the total population into standard and nonstandard subpopulations.

Donald MacKenzie in his *Statistics in Britain* argues that it is not so much that Galton's statistics made possible eugenics but rather that “the needs of eugenics in large part determined the content of Galton's statistical theory” (52). In any case, a symbiotic relationship exists between statistical science and eugenic concerns. Both bring into society the concept of a norm, particularly a normal body, and thus in effect create the concept of the disabled body.

Francis Galton's biography demonstrates an interesting convergence of interests and relations. On the one hand Sir Francis Galton was cousin to Charles Darwin, whose notion of the evolutionary advantage of the fittest lays the foundation for eugenics and also for the idea of a perfectible body undergoing progressive improvement. As Andrew Farrall puts it, “Eugenics was in reality applied biology based on the central biological theory of the day, namely the Darwinian theory of evolution” (55). Darwin's ideas serve to place disabled people along the wayside as evolutionary defectives to be surpassed by natural selection. So, eugenics became obsessed with the elimination of ‘defectives’, a category which included the ‘feebleminded’, the deaf, the blind, the physically defective, and other deviants.

Galton is also related to Alexander Graham Bell, a phenomenal figure connected with the discourse of disability in the nineteenth century. In 1883, the same year that the term ‘eugenics’ was coined by Galton, Bell delivered his eugenicist speech *Memoir upon the Formation of a Deaf Variety of the Human Race*, warning of the “tendency among deaf-mutes to

select deaf-mutes as their partners in marriage” (19) with the dire consequence that a race of deaf people might be created. This echoing of Dr. Frankenstein's fear that his monster might mate and produce a race of monsters emphasizes the terror with which the ‘deviants’ were looked at.

On the other hand, Galton also invented the idea of using fingerprints for identifying people. Noting how the various interests come together in Galton, we can see evolution, fingerprinting, and the attempt to control the reproductive rights of the deaf as all pointing to a conception of the body as perfectible but only when subject to the necessary control of the eugenicists. The identity of people becomes defined by irrepressible identificatory physical qualities that can be measured. “Deviance from the norm can be identified, indeed be criminalized, particularly in the sense that fingerprints came to be associated with identifying deviants who wished to hide their identities” (Davis 15).

While we tend to associate eugenics with a Nazi-like racial supremacy, it is important to realize that eugenics was not the trade of a fringe group of rightwing, fascist maniacs. Rather, it became the common practice of many, if not most, European and American citizens. When Marx used Quetelet's idea of the average in his formulation of average wage and abstract labor, socialists as well as others embraced eugenic claims, seeing in the perfectibility of the human body a Utopian hope for social improvement. Once people allowed that there were norms and ranks in human physiology, then the idea that we might want to, for example, increase the intelligence of humans, or decrease birth defects, did not seem so farfetched. These ideas were widely influential: in the ensuing years the leaders of the socialist Fabian Society, including Beatrice and Sidney Webb, George Bernard Shaw and H. G. Wells, were among the eugenicists (MacKenzie 34).

Daniel Kevles, in *In the Name of Eugenics* demonstrates how the influence of eugenicist ideas persisted well into the twentieth century. Notably, he quotes Emma Goldman's statement that unless birth control was encouraged, the state would "legally encourage the increase of paupers, syphilitics, epileptics, dipsomaniacs, cripples, criminals, and degenerates" (90).

The problem for people with disabilities, according to Kevles, was that eugenicists tended to group together all allegedly 'undesirable' traits. So, for example, criminals, the poor, and people with disabilities might be mentioned in the same breath. Take Karl Pearson, a leading figure in the eugenics movement defined the 'unfit' as follows: "the habitual criminal, the professional tramp, the tuberculous, the insane, the mentally defective, the alcoholic, the diseased from birth or from excess" (Kevles 33). In 1911, Pearson headed the Department of Applied Statistics, which included the Galton and Biometric Laboratories at University College in London. This department gathered eugenic information on the inheritance of physical and mental traits including "scientific, commercial, and legal ability, but also hermaphroditism, hemophilia, cleft palate, hare-lip, tuberculosis, diabetes, deaf-mutism, polydactyly (more than five fingers) or brachydactyly (stub fingers), insanity, and mental deficiency" (Kevles 38-9).

Here again, we are presented with a strange selection of disabilities merged with other types of human variations. All of these deviations from the norm were regarded in the long run as contributing to the disease of the nation. As one official in the Eugenics Record Office asserted: the calculus of correlations is the sole rational and effective method for attacking . . . what makes for, and what mars national fitness. . . The only way to keep a nation strong mentally and physically is to see that each new generation is derived chiefly from the fitter members of the generation before (Kevles 39-40).

Daniel Kevles further suggests that one of the central focus of eugenics was what was broadly called 'feeble mindedness.' This term included low intelligence, mental illness, and even 'pauperism,' since low income was equated with 'relative inefficiency' (Kevles 46). Likewise, certain ethnic groups were associated with feeble-mindedness and pauperism. Charles Davenport, an American eugenicist, thought that the influx of European immigrants would make the American population "darker in pigmentation, smaller in stature . . . more given to crimes of larceny, assault, murder, rape, and sex-immorality" (Kevles 48). In his research, Davenport scrutinized the records of "prisons, hospitals, almshouses, and institutions for the mentally deficient, the deaf, the blind, and the insane" (55).

The loose association between what we would today call disability and criminal activity, mental incompetence, sexual license, and so on established a legacy that people with disabilities are still having trouble living down. This equation was so strong that an American journalist writing in the early twentieth century could celebrate "the inspiring, the wonderful, message of the new heredity" as opposed to the sorrow of bearing children who were "diseased or crippled or depraved" (Kevles 67). The conflation of disability with depravity expressed itself in the formulation 'defective class.' As the president of the University of Wisconsin declared after World War One, "we know enough about eugenics so that if the knowledge were applied, the defective classes would disappear within a generation" (Kevles 68). The eugenics movement was, it must be noted again, not championed only by eccentrics, Kevles lists many prolific writers, scholars, statesmen and political leaders supporting the cause. "Davenport was funded by Averell Harriman's sister Mary Harriman, as well as John D. Rockefeller, Prime Ministers A. J. Bal- four, Neville Chamberlain, and Winston Churchill, President Theodore Roosevelt, H. G.

Wells, John Maynard Keynes, and H. J. Laski, among many others, were members of eugenicist organizations” (68).

Cyborg Theory: Theorizing a Post-Disabled World

The ideas of eugenicists aside, as far as physical disabilities are concerned, they can be reduced to just a nuisance if proper policies are constituted and opportunities are created to make space for such people in the mainstream. Despite tall claims by eugenicists, people are still born with a body that does not meet the standards of the perfect body. In order to disrupt the entrenched notion of disability, we will also need to retheorize the body itself. Unsettling of the notion of disability and a perfect human body can offer a theoretical possibility of a post-disabled or post-disability world.

Donna Haraway, conceptualizing a posthuman identity in some of her works, has examined what counts as nature in a way that speaks to all forms of posthuman embodiment. She acknowledges that there have always been bodies that create ontological anxiety in their failure to conform. On the other hand, she also points to technological practices, such as xenotransplantation, genetic engineering, transsexual surgery and cloning to demonstrate the way in which they blur the boundaries of the fixed human body.

To understand and explain this body that does not conform with the established standards of human body, Haraway reinvents the concept of the cyborg. This cyborg entity is a half-human half-machine creation that embodies and materializes the breaking of traditional patriarchal distinctions between human and machine on one hand, and physical and abstract on

the other. The cyborg is simultaneously a living being and a narrative construction. In its dual existence as both, a technological object and a discursive formation, it embodies the power of the imagination as well as the materiality of technology.

Haraway also critiques the way in which science has projected men as the norm of all humanity, ignoring women's lives, and ignoring the fact that these lives have historically differed in important ways from those of men. She warns against appeals to traditional doctrines of objectivity for the grounding of feminist knowledge and politics. Modernist doctrines of objective vision, she suggests, have underpinned the deployment of fixed identity categories. Yet there is nothing about being 'female' that binds women together politically and ideologically. Her commitment to 'situated knowledges' and partial truths does not give way to extreme relativism but works towards conceptualizations, mainly of the object of science, that allow for connectivity and interdependence.

The concept of cyborg can apply to the disabled individuals as well. They are cyborgs, primarily because they are entities that do not conform to the idea of a 'normal' human body. Just like Haraway's conception of cyborgs, they are a hybrid of a material and abstract/imaginary being. The disabled have been kept out of the mainstream social sciences and have been allowed no agency of their own. They too will need a different paradigm to become equal, even if theoretically, to everyone else.

"By the late twentieth century, our time, a mythic time, we are all chimeras, theorized and fabricated hybrids of machine and organism; in short, we are cyborgs" (Haraway 150). This assertion from Donna Haraway's cyborg Manifesto applies to all those socially constructed subjects that have been created using, what Foucault calls, biopower. Even though Haraway uses

the concept of the hybrid beings in relation to feminist discourse, this concept can very well be applied to disability discourse as well. In the following paragraphs I will try to establish how Haraway's concept of cyborg is applicable to the disabled and how it can be equally liberatory, not necessarily emancipatory, for those defined as disabled.

So how are the disabled individuals 'chimeras,' "theorized and fabricated hybrids of machine and organism?" Before we come to that, it will be worth understanding them as hybrid of reality and fabrication. As discussed in the section about Foucault and his relevance to disability theory, the disabled as a subject has been a constructed being for a long time. The semantic field of the word 'chimera' entails a fictitious being, an outcome of fabrication, or a product of discourse. Theories formed by the experts in the field of disability presents disabled people as juvenile, needing help with everything, always requiring surveillance so that they don't harm themselves and others in the society. Such an essentialist conception of disability imposes a fictitious identity on such people, making them an imaginary being, a hybrid composed of what they naturally are and what the discourse theorizes them to be.

Whereas Haraway talks about cyborgs in today's context, Rosemarie Garland-Thomson in her *Freakery: Cultural Spectacles of the Extraordinary Body* talks about them in context of the past. I will later on discuss their future in relation to Ray Kurzweil's prediction about spiritual machines. It should be noted here that neither Thomson nor Kurzweil calls them cyborgs.

Whereas Haraway discusses her cyborg theory in light of the current feminist discourse, Garland-Thomson in *Cultural Spectacles of the Extraordinary Body* examines western thinking of the past about the people who are 'not normal,' who look different from the expected body of

a human being. The author demonstrates how the “fathers of western thought”: Aristotle, Cicero, Pliny, Augustine, Bacon, and Montaigne explain such disruptions of the natural order in their “interpretative schemata.” For these thinkers who are responsible for the Enlightenment, the differently formed body is most often evidence of God's design, divine wrath, or nature's abundance, but the sight of a different body always lets their interpretation lose.

“The anomalous human bodies that are familiar and alien simultaneously, offer cultures reasons to invent fanciful hybrids such as centaurs, griffins, satyrs, minotaurs, sphinxes, mermaids, and Cyclopes--all figures that are perhaps the mythical explanations for the startling bodies.” What seems clear to the author in all this is that the extraordinary body is fundamental to the narratives by which human beings make sense of themselves and their world.

Extraordinary Bodies interrogates some Freak shows that were regularly organized in the past to show off those disabled people who could defy their disability and perform tasks otherwise considered impossible for people with missing limbs. These shows Exoticized disabled individuals who could function like ‘normal’ human beings. An American freak has been specially discussed who could roll his own cigarette, light it and smoke, performing all these feats using only his lips. Such demonstrations are otherwise used to show off the skills of animals, monkeys, apes, dogs, and other such animals. The freak who could smoke just by using his lips is not technically a cyborg, nor he is treated like a ‘normal’ human being, a perfect case, as I will discuss later, for moving the discussion on to the cyborg age.

Before moving from freaks on to cyborgs, it will be worth stating that Leslie Fiedler in his *Freaks: Myths and Images of the Secret Self* claims that freak shows have returned to popular culture in a new avatar. Fiedler in his book critiques the exploitative voyeurism of nineteenth-

century forms such as the freak show, he finds even less solace in the invasive conventions of contemporary literature (7). Not only does he find the freak show alive and well in current literary metaphors, he argues that the artistic thirst for the freakish and grotesque now openly revels in that which the former century concealed and dissimulated.

Haraway's *Simians, Cyborgs, and Women: The Reinvention of Nature* is the foundational text of cyborg feminist literature in which she revisits primates, apes and monkeys to understand what probably can be the prehuman identity of today's cyborgs. 'Human' as defined by the Enlightenment and humanism, is probably not a fixed or just interpretation of a human being. The 'human' of humanism, as Katherine Hayles points out, excludes any identity that is not a well-to-do white male. It won't be wrong to suggest that a disabled individual is not human according to that definition. If one agrees with Haraway's and other cyborg feminists' conclusion that a woman is not a human according to Humanism, the same will apply to disabled individuals as well. The way experts define Disabled renders them abnormal, and to be human one has to be normal.

Thus deconstructionist approach renders the binary opposition between normal/abnormal immaterial. Haraway, as I will demonstrate later in the dissertation, deconstructs several of these binaries in her book. Ability/disability, in the sense that I am concerned with here, is not one of those. But as I suggested earlier, this deconstruction easily fits in to the framework laid down by Haraway.

The book culminates with a cyborg manifesto, which was written, in Haraway's words, to find political direction in the 1980s in the face of the hybrids 'we' seemed to have become world-wide. The manifesto will be my point of entry to better understand Haraway's cyborg

theory and how it applies to disability theory. As Haraway says, cyborg is a creature in the post-gendered world (150), I suggest that it will be a creature in a post-disability world as well.

One may see a contradiction between Haraway's declaration that "By the late 20th century ... we are cyborgs," and her assertion that cyborg is creature of post-gendered world. We should be able to conclude that we are already in post-gender world because, as in Haraway's formulation stated earlier, by late 20th century we are all cyborgs and cyborg is the creature of post-gendered world. We know that gender still exists and so does disability. The only theoretical explanation to resolve this contradiction is a post-structuralist analysis. Post structuralist thought allows for the simultaneity of contradictory propositions.

Technology that has the power to transform one in to a cyborg can make gender irrelevant. It can help do away disability as well. At least, it can help us think about disability from a different perspective.

Marshall McLuhan, in a discussion of how all our technologies bring new enterprises but also chip away at our faculties, cites Edward T. Hall from *The Silent Language*: "Today man has developed extensions for practically everything he use to do his body. The evolution of weapons begins with the teeth and the fist and ends with the atom bomb. Clothing and houses are extensions of man's biological temperature-control mechanisms. Furniture takes the place of squatting and sitting on the ground. Power tools, glasses, TV, telephones, and books which carry the voice across both time and space are examples of material extensions. Money is a way of extending and storing and labor. Our transportation networks now do what we used to do with our feet and backs. In fact, all man-made material things can be treated as extensions of what man once did with his body or some specialized part of his body" (27-28).

The denizens of the cyber world maintain two different existences, the one material and the other virtual. In the virtual life people can live without their differences, and their disabilities.

Merleau-Ponty in *Phenomenology of Perception* lays down his theory of embodiment which can be relevant in this context. The theory argues that something we regularly use in addition to our natural body becomes part of us. A cane for a blind individual, or a prosthetic for an amputee, is as integral to the body as any other parts of their body are. According to that definition, Stephen Hawkins with his speech synthesizer is more of a cyborg than a natural man. Over the time, as Hall suggests, human beings have embodied many artifacts that were not originally part of the human body. The cyborg identity for Haraway, I must reemphasize, is also accentuated by the physical extension of one's human identity.

Haraway defines cyborg as a hybrid creature, composed of organism and machine. But, organism and machine cyborgs are composed of a special kind that is appropriate to the late twentieth century. They are described as information systems, texts, and ergonomically controlled laboring, desiring, and reproducing systems. If analyzed from this perspective, a disabled person becomes a cyborg when she/he is constantly connected to, and interacts through, technology. A cyborg identity must be envisaged for a disabled individual, keeping in view the hybrid nature of technology-mediated identity, which is in marked contrast to the singular identity of disabled forced upon a differently abled individual. This veiled identity can, arguably, liberate a disabled individual from the restrictive binary of abled/disabled. In a face to face classroom, for instance, a teacher may turn patronizing or biased against a disabled because of his/her disability, but in the online environment, where the disability is obfuscated by technology, one's identity as 'disabled' is obviated. This apparent transformation of identity is

effected for all denizens of technology realm, regardless their class, creed, culture, color and cause of disability.

Cyborg feminist theorists have discussed the concept of embodiment and disembodiment extensively. Katherine Hayles, for example, talks about the possibility of uploading an individual's consciousness on a computer, in other words the disembodied self which can be downloaded on different bodies and machines.

Whereas Haraway investigates 'body' using a post-feminist approach inspired by technology, Merleau-Ponty's work uses a phenomenological perspective to investigate the body. One of Merleau-Ponty's notions is 'embodiment', which alludes to interconnectedness, and he calls the body a 'grouping of lived-through meanings which moves towards its equilibrium' (153). He introduces the innovative idea that the body 'extends' an object, for example a cane for the blind, so that it becomes a part of the body. This 'extension of the bodily synthesis' is a process of embodiment (152), and this search for equilibrium also seems to be the core of adjustment by a person to his or her impairment.

Neho Iwakuma discusses embodiment in the context of disability. She cites an interview with a visually impaired pianist who says, "The piano is a part of my body that cannot be separated from me." In order to understand this phenomenon, Iwakuma says, one must go beyond empiricism and the Cartesianism. His assertion is not just figurative or metaphoric speech: the piano is an extension of his body. He has embodied the piano as a part of his identity and, without it, he would lose who he is. For a person with a visual impairment, a cane serves the same function as does a hearing aid for the deaf.

Since cyborg is defined as a body extended or punctuated with unnatural and nonhuman parts, individuals with such extended bodies can be called cyborgs. Used in this sense, the concept applies to many more individuals than just disabled and women. One can think about iPods and cell phones with earplugs always sticking to the ears of the youth today. The elite in British India were identified with their canes as blind today are. If used in this sense, cyborg theory transforms the conception of disability. Like nondisabled beings, they embody external nonbodily elements to add to their persona.

Haraway attributes her conception of cyborgs to three crucial boundary breakdowns visible in the late twentieth century in United States. The boundary between human and animal is thoroughly breached by the scientific culture. There are several examples in the modern age of disabled individuals being kept in a secluded place, symbolic of a cage. Mentally challenged people, as Foucault tells us in *Madness and Civilization*, were quarantined way back in the late 16th century and are often still kept in asylums. Scientists in Hitler's Germany carried out experiments on disabled people as scientists do on animals. Moreover disabled people were taught to perform in freak shows the tasks quite normal for human beings but unusual for animals.

Similarly, Haraway suggests, the boundaries between human and machines are breached. In the 'enlightened' age of Humanism human beings have been treated as machines. The scenario that comes to mind about disabled people being used more as a machine than human being is in sheltered workshops. These workshops use disabled individuals to produce different kind of items. The disabled workers slog throughout the day in the name of being trained, yet they are not recompensed even the minimum wages. These workshops make big profits out of

the products manufactured by these trainees/employees. However, because the sheltered workshops are exempt from the Federal Standard Labor Act, these employees get either nothing or almost nothing for their work.

The third distinction is a subset of the second: the boundary between physical and non-physical is very imprecise. Haraway's explanation of this kind of boundary breakdown is a bit complex. However, at the risk of oversimplifying her, Haraway seems to be saying that the machines are getting smaller and smaller to such an extent that you may not even know if they are physically there. In the context of disability I would like to explain it a little differently. Many disabled persons complain that when they are out with a nondisabled person to an office, library, store, restaurant etc, the nondisabled person will be addressed even if the issue is concerning the disabled person. In that sense a disabled person, even if physically present, is deemed as not physically present. This fact brings the disabled closer to a machine than to an animal.

Having discussed cyborg theory from a post-structural and phenomenological perspective, I would like to examine the concept from the perspective of computer science and popular science. Ray Kurzweil has written about technology-driven evolution of human beings. In his books, *The Age of Spiritual Machines* and *Singularity is Near*, Kurzweil conceives of a similar being as Haraway theorizes as cyborg. Unlike Haraway who links cyborg to ontological and political issues, Kurzweil considers these creatures as technological evolution of human beings in to machines that can think and feel.

Kurzweil predicts a time when human beings will have an internet chip linked directly to their brains. You would just think about a given thing and then directly receive the result in the

brain. The integrated chip will allow these beings to perform Internet searches, or interact with and enjoy the company of their other fellow beings. These human machines will be able to conduct all their activities without having to move at all. Since human beings won't need to go anywhere to get things done, they would not need most of their body parts for their survival. In due process of evolution, they will shed off the parts not required for their survival. Even if they lose their limbs, this process will not make them disabled. Fewer body parts will require less energy and they will cause less biological wear and tear. In other words, we can conceive of a time when missing body parts will make a human being more efficient and more able-bodied. Kurzweil conceives of a stage in technology driven human evolution when human beings will be able to upload and replicate their 'consciousness' and will not have to depend on their bodies at all.

When people are branded as disabled, they are assumed to be challenged in using their senses or their mental faculties. The spiritual machines evolved from human beings will have their brain directly linked to the internet circuits rendering the other senses redundant. One can safely assume that faulty neural system will not be of any consequence in that scenario. Since people will not have to go out of their domain, there will be no need for walking or seeing. Communication will be possible via the circuits directly to and from the brain so not being able to speak and hear will be a problem of the past. In the age of spiritual machines no one will feel disabled. The age of Spiritual Machines will be the creature of the post-disabled and probably post-gendered world, the proclamation Haraway makes for the cyborg.

Conclusion

In this chapter I attempted to revise the notion of disability that is prevalent in society, including the academic world. My goal in this chapter was to disrupt the binary of ‘disabled’ and ‘able-bodied,’ which is based, like other relevant binaries, on an arbitrary signification process. I demonstrated the inspiration and influence of post-structuralist and postmodernist ways of theorizing on scholars working on disability related issues. This chapter established that people with disabilities undergo the same kind of ‘othering’ and ‘marginalizing’ experience in this ‘normate’ world, which any other class of people who are different undergoes.

The discussion on Foucault’s work helped us understand the processes of subject formation. I applied a Foucaultian method of analyzing the normalizing and divisive forces to explain the formation of a disabled subject. Derrida’s concept of ‘metaphysics of presence’ also helped establish a common ground between disabled people’s experience and the experience of others who are situated at the under-privileged side of the binary opposition.

The chapter also discussed the push back by many disability scholars and activists against the established misconceptions and misperceptions about disability. These activists and scholars are skeptical of the institutionalized ‘experts’ who are authorized to shape policies and programs for the rehabilitation of the disabled. These experts, the disability activists and disability scholars argue, perpetuate the myth of ignorance and inferiority associated with people with disabilities.

To challenge the entrenched notion of disabled being abnormal, I discussed the concept of normalcy and presented a historical overview of the advent and ascendance of normalcy in the Western society from 18th century onwards. The concept of an average/normal body rendered the

people with bodies that would not conform to the norm abnormal and inferior. Many scholars mentioned in the chapter pathologized abnormalities and linked them to criminality. This discussion also included the attempts of eugenicist movement to eradicate abnormalities in human bodies.

In the last part of the chapter I explored theoretical possibilities of a post-disabled world. The inspiration for this section of the chapter came from feminist writers like Donna Haraway and Katherine Hayles, who have used cyborg theory to conceive of a posthuman world. Ray Kurzweil's ideas of 'singularity' and 'spiritual machines' also helped me think about the human body in a different way.

There has been a history of segregation of the disabled in the civilized Western societies. This segregation can still be felt at various levels of the society by the disabled people. A discussion indicating a convergence in the experience of the disabled people and other less privileged people in the society can help bring the disabled on a platform shared by those who are traditionally not labeled as 'disabled.' This kind of rhetorical attempt can help bring disability studies out of isolation and usher it in to the realm of mainstream academia.

CHAPTER THREE. DECONSTRUCTING SPEECH-BASED ASSISTIVE TECHNOLOGY: PRINT-DISABLED AND EMBODIMENT OF BOOKS IN TO ALTERNATIVE BODIES

I concluded the previous chapter with a theoretical possibility of a post-disabled world, made plausible by technological and physical evolution of the body of human beings and machines. This kind of abstract theorizing was inspired by the ideas of embodiment, cyborgism and posthumanism prevalent in 'post-feminist' works. In this penultimate chapter, I will investigate the evolution of the book into an abstract information form which could be transplanted in to different formats, thanks to new discoveries in the world of technology.

This copy/paste of the 'consciousness' of the print book in to alternative bodies, I demonstrate, would especially be helpful for those people with print-disabilities. However, these alternative formats, such as electronic text and audio book, are increasingly being adopted to assist everyone. This discussion will culminate in deconstruction of the term 'assistive' in relation to 'assistive technology.' It will be exposing the rigidity of the system of signification, where when a technology, until the time it helps the disabled, is 'assistive.' When it starts helping others, in addition to the disabled, it is no more so.

The audio book, for instance, is such a format that originated and germinated thanks to the evolution of speech technology. Speech technology is the technology under consideration that was meant for, and is still primarily associated with, people with print disabilities. With the evolution of technology, it has been adopted by people in general. Nonetheless, it is regarded as 'assistive,' unless it is being used by someone not signified by the term 'print-disabled' to listen to text, audio book, or a podcast and the likes.

In the next chapter I will discuss speech technology in relation to the concept of ‘secondary orality’ introduced and theorized by Walter Ong and Marshall McLuhan. In this chapter, however, I will discuss speech technology without referring to ‘secondary orality,’ primarily because the concept of ‘secondary orality’ was chronologically introduced long after speech based technology had flourished to a great extent.

I will elucidate, later in this chapter, whether the human form turning into an abstract information form, or the book turning in to an abstract electronic format, it will be nothing but a digitized version of the atoms. As the discussion below will reveal, many scholars have written about the difference between bits and atoms, and many have demonstrated the positive aspects of bits. Digital scholars, such as Nicholas Negroponte, have strongly argued in favor of digital conversion of atoms in to bits, while elucidating the limitations of atoms. Champions of atoms, Sven Birkerts for instance, emphatically caution against the digital realm replacing the world of atoms.

However, Katherine Hayles, invoking Derrida’s concept of ‘supplementarity,’ argues in favor of a non-binary approach in the context of dematerialized form of the posthuman creatures. Because I am applying a deconstructive approach, primarily to subvert the dichotomy of disabled and nondisabled on one hand, and that of assistive and mainstream technologies on the other, I favor Hayles’ approach. I will argue, in the context of conversion of material form of books in to digital form, that one need not replace the other. Both can exist simultaneously.

I will return, later in this dissertation, to the hierarchy of information/materiality in a different context. I will defend audio books against the claim that they can’t be called books. Any discussion about electronic or audio books always leads to the anatomy of books which

some scholars, such as Sven Birkerts, hold sacred. The human body also has been endowed with sacred credentials by many scholars. Posthuman creatures and electronic books share in this common possibility of disembodiment of their original selves: the former liberated of the limitations of their human body, the latter liberated of the limitations of the print format.

Disembodiment of Sound and Disembodiment of Book

N. Katherine Hayles, in her esteemed treatise investigating the question that gave her book its title, *How we Became Posthuman*, has included an entire chapter on tape recording technology. She takes us back to a period when it was a startling discovery to learn that one's voice could be taken out of the body and put into a machine, where it could be manipulated and re-presented in a way the listeners wanted. Hayles has discussed tape recording technology in relation to her attempt to challenge information/materiality hierarchy. Posthuman machines/humans Hayles conceptualizes, will primarily be information systems with their materiality rendered immaterial or inconsequential. As we discussed in the previous chapter, it is theoretically possible to upload one's consciousness on to machines or other 'information systems.'

Nicholas Negroponte's "The DNA of Information" is a good starting point for this atom/digit debate. As the title suggests, this article discusses the positive aspects of digitization of information and the inevitability of digitization in this 'information age.' He defines 'bit' as "the smallest atomic element in the DNA of information, which has no color, size, or weight, and it can travel at the speed of light." Yet, he demonstrates, in the context of the year 1995, most

information is delivered in the form of atoms: newspapers, magazines, and books. He sees no reason for clinging on to the atoms if atoms can be transformed in to bits.

Sven Birkerts, a skeptic of the world of bits, approaches this subject from a different perspective. In his *Gutenberg Elegies* he ruminates on the discussion about bits and atoms as it figures in Negroponte's *Being Digital*. Birkerts defines atoms and bits as follows: "Atoms, though invisible to the naked eye, exist in space; they are the foundation stones of the material order. Bits, by contrast, are digits; they are coded information -arrangement of zeroes and ones - and while they pass through appliances made of atoms, they do not themselves have any materiality. They weigh literally nothing. Atoms are like bodies and bits are like the thoughts and impulses that instruct them in their motions. Indeed, we can assert that ideas and the language that expresses them are bits; books are atoms, the bodies that sustain them."

Negroponte seems to have prefigured the concerns of the purists like Birkerts and has responded to them. The main argument he makes in the essay is that bits will end up replacing atoms is the certainty of the digital age. The transfer of knowledge and cultural transaction has happened and will keep happening by way of bits/digits. In that sense, knowledge has always been digital. Scientifically speaking, there is no cause for concern when/if audio books replace the printed books. David Bolter has covered this debate between the champions of electronic format of the book and the established format of the print book extensively in his *Writing Space*. I will return to this debate in the next chapter when I discuss audio books further.

When Katherine Hayles extends this possibility of digital conversion of human beings, in the form of their consciousness, she argues that both versions, abstract and material, do not have

to be exclusive of each other. We can apply her reasoning discussed below equally in the context of books and other forms of information.

Explaining the relevance, and lack thereof, of ‘cellular automata’ model to her conceptualization of a posthuman entity living without body, Hayles clarifies, “No one suggests that because atoms are mostly empty space, we can shuck the electron shells and do away with occupying space altogether. Yet the cultural contexts and technological histories in which cellular automata theories are embedded encourage a comparable fantasy--that because we are essentially information, we can do away with the body.”

Hayles does not completely reject the formulation of ‘cellular automata’ model that argues in favor of the possibility of a posthuman being devoid of a corporeal existence. Yet she is skeptical of it because it may prioritize the abstract over the physical. “Central to this argument is a conceptualization that sees information and materiality as distinct entities. This separation allows the construction of a hierarchy in which information is given the dominant position and materiality runs a distant second” (11). It is this materiality/information dichotomy that Hayles claims to be contesting, not the cellular automata model per se, or other related theories.

Cautioning against relegating one side of the binary to a less favored position and elevating the other to a privileged position, Hayles says, “As though we had learned nothing from Derrida about supplementarity, embodiment continues to be discussed as if it were a supplement to be purged from the dominant term of information, an accident of evolution we are now in a position to correct.”

Derrida's views on 'supplementarity' will be crucial when I come back to the debate about electronic books. His theory of 'supplement' will help me establish that an argument in favor of digital books does not have to be an argument against print books. Both formats have their value for different kind of readers, and the same kind of readers on different occasions. It is the hegemony of one format that needs to be challenged, not the existence of it.

While challenging the information/materiality hierarchy, Hayles's strategy in her argument is to complicate the "leap from embodied reality to abstract information by pointing to moments when the assumptions involved in this move were contested by other researchers in the field and so became especially visible." The point of highlighting such moments, Hayles explains, is "to make clear how much had to be erased to arrive at such abstractions as bodiless information." In other words, those contesting the idea of theoretical metamorphosis of material body had a lot to say in favor of the inevitability of material body. Yet, it is not possible to conceive of an abstract form of humanity if we keep theorizing the body from a rigid standpoint. In the context of the debate regarding materiality/abstraction of the book, erasure will be required as well. The list of erasures, in this context, will include its looks, its touch, cover, binding, its pillow function and many such elements that do not fit in to the disembodied abstract format, and about which writers like Sven Birkerts have profusely reminisced in their work. Theory always requires abstractions, abstractions make theorizing possible. Abstraction is, as Hayles reminds her readers and critics, "an essential component in all theorizing, for no theory can account for the infinite multiplicity of our interactions with the real" (12).

In her postmodernist vein, Hayles cautions, "when we make moves that erase the world's multiplicity, we risk losing sight of the variegated leaves, fractal branchings, and particular bark

textures that make up the forest.” The same can be addressed to the critiques of the notion of electronic book. Multiplicity, in the context of this debate about books, interestingly, literally helps save forests. Books made available in formats different from the print books, it has been argued, will control the cutting of trees for paper. Metaphorical variegated leaves, fractal branchings, and particular bark textures that get neglected in enforcing univocal understanding of the book, refer to chunks of multiple information segments contained in a given book.

It is the multivocal conception of the book that helped bring people with print-disabilities from the darkness of the sheltered workshops to the enlightened world of scholarship and gainful employment. Invention of tape-recording technology hastened that progression, but, as I demonstrate later in this chapter, the process of providing them with reading material started much earlier than that. But before discussing audiotapes as a new body for books, I will stop and explore what Hayles has to say about their history and their economic-geopolitical aspect.

Born in the early 1900s and coming of age after World War II, audiotape has already reached old age, if not already dead. Its near-extinct stage resulted from the invention of compact disks, computer hypermedia, and the like. The period when audiotape played an important role in U.S. and European consumer culture, Hayles says, may well be limited to the four decades of 1950-90 (208).

Hayles introduces William Burroughs in this context, who in his cybernetic trilogy, *The Ticket That Exploded*, *The Soft Machine*, and *Nova Express*, was close enough to regard the beginnings of audiotape as a technology of revolutionary power. It gave a new angle to the debate surrounding ‘logocentrism.’ Long after writing separated presence from inscription, voice continued to imply a subject who was present in the moment and in the flesh. This technology,

however, changed this equation. Audiotape was definitely not the first technology to challenge this assumption, audio technologies that heralded that scenario particularly include telephone, radio, and phonograph.

Even though telephone and radio dissociated presence from voice by making it possible to transport voice over distance well before audiotape and phonograph did, telephone and radio technologies did not separate sound from presence. In other words, speaker and listener, although physically separated, shared the same moment in time. “Telephone and radio thus continued to participate in the phenomenology of presence through the simultaneity that they produced and that produced them” (Hayles 209). In this sense they were more like each other than either was like the phonograph. By contrast, the phonograph functioned primarily as a technology of inscription, reproducing sound through a rigid disk that allowed neither the interactive spontaneity of telephone nor the ephemerality of radio.

Like the phonograph, audiotape was a technology of inscription, but with the crucial difference that it permitted erasure and rewriting. As early as 1888, Oberlin Smith, at one time president of the American Society of Mechanical Engineers, proposed that sound could be recorded by magnetizing iron particles that adhered to a carrier. However, he was too busy to implement his idea. Danish engineer, Valdemar Poulsen, accidentally discovered that patterns traced on the side of a magnetized tuning fork became visible when the fork was dipped in iron powder. When the fork was demagnetized, the patterns were erased. He saw in the imprinting and erasure of these patterns the possibility of a recording device for sound, using iron wire as the carrier. Its immediate commercial use, he imagined, would lie in providing records of telephone conversations. He called the device a ‘Telegraphone,’ which he understood to signify

“writing the voice at a distance” (214). In 1900 he won the Grand Prix for his invention at the Paris Exposition. Despite extensive publicity, however, he was not able to raise the necessary capital in Europe for its development. By 1903 the patents had passed to the American Telegraphone Company which raised \$5,000,000 by selling stock. Five years later the owners of ATE had still not built a single machine. Their main business, in fact, turned out to be raising money for the machines rather than actually producing the machines. When they did finally turn out a few operational devices in 1911, using the famous model Phoebe Snow to advertise them as dictation machines, the sound quality was so poor that the DuPont Company, who were brought in to the idea of installing them in a central dictation system, ended up suing. The questionable status of the machines got worse during the First World War, when the Telefunken Company of America was accused of using them to encode and transmit secret messages to Germany. From the beginning, audiotape was marked with the imprint of international capitalism and politics as surely as it was with the imprint of voices (209).

By 1932, steel tape had become the carrier of voice in high-end machines, and the British Broadcasting Corporation (BBC) became actively interested in the development of steel tape, using it to carry the Christmas address of King George V in that year. Film tape, created by coating paper or plastic tape with iron oxide and feeding it through a ring-shaped head, appeared on the scene by 1935. The great advantage of film tape was that it could be easily spliced, but originally it had such poor sound quality that it could not compete with steel tape. By 1941 the sound quality of film tape had so improved that it was competitive with steel tape in studio work. On the consumer market, machines with wire were still common. It was not until after World War II that systematic research was carried out to find the optimum coating material for film

tape, and only in 1948 was the first American patent issued for a magnetic recording machine using film tape and a ring head. The use of film tape then expanded rapidly, and within a decade it had rendered steel tape obsolete, with film tape being used in the consumer market as well as the professional studios.

It was by the late 1950s that magnetic tape had acquired the qualities that made it a deconstructive tool: it could contain/disrupt dichotomies. “It was a mode of voice inscription at once permanent and mutable, repeating past moments exactly yet also permitting present interventions that radically altered its form and meaning” (Hayles 211). These interventions could, moreover, be done at home by anyone who had the appropriate equipment. Whereas the phonograph produced objects that could be consumed only in their manufactured form, magnetic tape allowed the consumer to be a producer as well. The switches activating the powerful and paradoxical techno-conceptual actors of repetition and mutation, presence and absence, were in the hands of the masses, at least the masses who could afford the equipment (212).

Print-Disabled, the Unintended Beneficiaries of a “Late-Modern” Device

Unbeknownst to the historians and designers of audio technology, this evolution in audio technology, tape-recorders and magnetic tapes was being keenly followed by blind individuals and the organizations working for the rehabilitation of the blind. Even though Thomas Edison clearly stated books for the blind as the benefit of the device in his application for the patent of phonograph, the industry was not targeting print-disabled while designing and promoting their products. It was despite this fact that some agencies had started working towards preparing ‘talking books’ for the blind in early twentieth century.

Due to ‘ablist bias’ among them, academia and industry have hardly included the print-disabled in their thought process. Because of that, as I demonstrate in this dissertation, the technologies of the print-disabled and print-dependent people is regarded separate, even if it is not different in the context of speech technology. In the next chapter I will demonstrate how Apple took a different approach in recent years. They are targeting the print-disabled as well as other users in their promotionals.

The best example of disregard of the print-disabled by academia and the industry in the mainstream technological realm is the story of Sony Walkman. *Doing Cultural Studies: The Story of the Sony Walkman* presents a well-researched history of the device that became the cultural fetish of the day when it was introduced. Interestingly enough, Paul DuGay and his colleagues do not include the word ‘blind,’ or any related word for that matter, in the entire book. It is despite the fact that the blind students, teachers and casual readers were equally mesmerized by this device as their sighted counterparts.

The blind owners of the device were thrilled to realize that it was a device they could independently use. It was the first player they could carry in their pockets with audio books, or whatever else they chose to listen to. Sony Walkman was significantly smaller in comparison to the large devices they had to use before Sony introduced it in the market. The recording feature in the Walkman and similar devices that followed the footsteps of Sony Walkman enabled the blind individuals and people in general to create their own audio books. It meant that they could record on it books and other reading materials when an assistant was reading them aloud. After that there was no need to have the reading material read again by a human reader, they could just play it on their Walkman.

As is evident from its title, *Doing Cultural Studies: The Story of the Sony Walkman*, the book studies a culture as influenced by a phenomenon, and a phenomenon as influencing a culture with its own culture. The image of this Walkman, DuGay explains, “sleek, high-tech, functional in design, miniaturized - has become a sort of metaphor which stands for or represents a distinctively late-modern, technological culture or way of life” (11). I will contrast it later with iPhone and other similar Apple devices as standing for a postmodern technological culture, or way of life.

Sony Walkman, it is claimed in the book, is now part of our cultural universe. It has become inscribed in our informal social knowledge - the ‘what-everybody-knows’ about the world - without consciously knowing where or when they first learned it. “This kind of shared, taken-for-granted knowledge,” says DuGay, “is an essential element in what we call ‘culture’ . Belonging to a culture, we are told, “provides us with access to such shared frameworks or ‘maps’ of meaning which we use to place and understand things, to ‘make sense’ of the world, to formulate ideas and to communicate or exchange ideas and meanings about it” (8-10).

By not including the blind and other print-disabled in the story of Sony Walkman, DuGay seems to have reiterated what disability scholars have constantly criticized, that the disabled are not part of the mainstream; that they are not us. Disability scholars cite several examples to demonstrate how the disabled are made the cultural others, and this story of Sony Walkman suggests that they are technological others too.

Affordability of a Sony Walkman was still an issue for many blind readers, so they had to stick with the cumbersome players provided by the National Library Service. These devices were given to blind patrons for their use for free. They were specially designed for the blind, the factor

that makes them an assistive technology product. Sony Walkman was probably the first device that deconstructed the dichotomy of mainstream and assistive technology, even if Sony had never consciously intended it.

DuGay suggests, the Walkman, as such, means nothing in itself (17). Yet, it meant a lot for many, including the print-disabled to whom Sony Walkman provided freedom to move with the reading material. Immobility, it must be noted, is constantly associated with disability.

The best way to establish the meaning of a given sign within language, DuGay suggests in a Saussurean vein, is “by marking the relations of similarity and difference which allow us to map its position precisely in relation to, as well as to differentiate it from, the other objects in the same field or set” (17). My discussion of the similar devices that can be compared with Sony Walkman will help understand the relative meaning of this device for the blind and print-disabled.

A description of other devices, provided later in this dissertation, will help establish both syntagmatic and paradigmatic, relationships with the Walkman. As DuGay explains, “in language, meaning arises by plotting the relation between what something is and what it is not. If there were no differences between them, it would be hard to distinguish between them” (18). Those who could compare the difference between this new device and the cumbersome assistive technology device, provided to them by the National Library Service, could certainly see the real meaning of the Sony Walkman. Therefore, it can be definitely said that, Sony Walkman meant much more to the blind and others who could not read on their own, than what DuGay’s limited perspective could allow him to realize. After all, as DuGay says, “It is difference which signifies” (18).

Much more happened at local and federal, personal and institutional levels, to make reading accessible to the blind before Sony Walkman came as another relief. It was the availability through National Library Service of already existing audio books that made Sony Walkman more exciting. However, before NLS was established, other libraries were already functioning. These libraries played a big role in transplanting information from print format of the book to alternative formats accessible to the print-disabled. Thanks to the availability of the books and reading materials in accessible alternative formats, the print-disabled individuals can now expose and challenge the ablist bias prevalent in social as well as technological sphere. It will be worth briefly describing what transpired before NLS to make reading accessible to such people.

From Orality to Literacy: Books for the Blind, Early Ventures

According to NLS records, library services catering to blind patrons began in the late-nineteenth century. Before they could read on their own, the blind people were instructed by oral means. Their parents, teachers and other volunteers would read books aloud to them on certain occasions. As early as 1868, the Boston Public Library established a department for the blind when they received eight embossed Braille books. In 1882, the Pennsylvania Home Teaching Society and Free Circulating Library for the Blind were founded in Philadelphia and in 1899 were incorporated with the Free Library of Philadelphia. The Chicago Library, in 1894, received a collection of embossed books from a local women's club. The New York City Free Circulating Library for the Blind was organized in 1895 by a blind man who had a private collection of

embossed books. In 1903 this collection became the hub of the Library for the Blind of the New York Public Library. The Detroit Public Library could boast of 110 volumes on the shelves in 1896 (Irwin 18-27).

However, maintaining and operating a Braille library was much more difficult then than it is now. Few books were generally available and with five separate embossed systems in use, the number of titles from which a blind person could choose were few indeed. There was no sufficient funding and producing Braille books involved a huge cost. The state support was greatly needed. It was in 1896 that New York became the first state to create a department for the blind in a state library. It was a big moment in the attempts of making books available for the blind. Other state libraries soon followed New York's example and established departments to support these libraries.

In 1897, John Russell Young, the Librarian of Congress, developed the concept of a national library for the blind when he established a reading room for the blind with about 500 books and music items in raised characters. In 1913, Congress sanctioned funds for one copy of each of those books in raised characters made for educational purposes under government subsidy by the American Printing House for the Blind (APH) in Louisville, Kentucky.

Another supportive move came from Congress when in 1930 Representative Ruth Pratt (H.R. 11365) and Senator Reed Smoot (S. 4030) introduced identical bills asking to provide adequate service on a national scale through an appropriation to be expended under the direction of the Librarian of Congress. The Pratt-Smoot Act became law on March 3, 1931. The Librarian of Congress was authorized to arrange with other libraries "to serve as local or regional centers for the circulation of such books, under such conditions and regulations as he may prescribe." On

the following day a Joint Resolution was passed appropriating \$100,000 for fiscal 1932 to carry out the provisions of the act to provide books for blind adults and the program that would become the National Library Service for the Blind and Physically Handicapped (NLS/BPH) was established.

The book project, instituted under the above law for blind adults, began operating on July 1, 1931. Its primary concern was selecting titles to be embossed. The Annual Report of the Librarian of Congress for 1931 stated that, "By the middle of September, fifteen titles were selected as an experimental group and contracts for the reproduction of them in Braille, placed with the four American presses submitting proposals, to wit: American Printing House for the Blind, Louisville, Kentucky; Universal Braille Press and American Brotherhood of Free Reading for the Blind, Los Angeles, California; and Clovernook Printing House for the Blind, Cincinnati, Ohio, the experiment including a need of testing out the relative competence of those several presses." The first order, according to NLS records, was for Woodrow Wilson's George Washington to meet a demand created by the commemoration of the bicentennial of Washington's birth.

National Library Service used distributing regional libraries to facilitate smooth circulation of books. After consultation with the American Library Association and American Foundation for the Blind (AFB), the Librarian selected eighteen libraries, in addition to the Library of Congress, because of their ability to provide adequate service and regional coverage of the country.

Two important landmarks in the history of production of books in alternative formats for the benefit of the blind occurred in 1933. The first was the establishment of a uniform system of

Braille (Standard English Braille) for all English-speaking countries. As I said above, there were five different Braille codes and the reader of one code did not necessarily know how to read the other codes. This also facilitated transnational exchange of Braille books, and transnational exchange of ideas about producing them.

The second monumental landmark was production of ‘talking book,’ which was described by the producers as “the recording on a disc of the voice of a good reader, and its reproduction at will through the instrumentality of a reproducing machine or phonograph.” In the next section I will discuss this hugely important new development in the history of the book.

Before I conclude this section that covers books in Braille format, I must note that Braille books are primarily an electronic version of print books that are later embossed on the paper making it another book comprised of atoms. Braille also needs to be discussed from the orality/literacy point of view.

This debate about orality/literacy in relation to Braille was revived once again after a recent New York Times article. Rachel Aviv in her article simply titled “Listening to Braille” raised an important question about the adverse impact of use of text-to-speech by blind readers in comparison to Braille: “With New Technologies, Do Blind People Lose More Than They Gain?” Aviv demonstrated how effectively blind professionals and students are using text-to-speech technology on their computers and other reading devices and not paying attention to Braille.

Aviv framed the debate in the same vein as it is carried out about the fate of print: “A few decades ago, commentators predicted that the electronic age would create a postliterate generation as new forms of media eclipsed the written word.” Marshall McLuhan claimed that

Western culture would return to the “tribal and oral pattern.” However, in Aviv’s view, “the decline of written language has become a reality for only the blind.”

The article opens with the description of Laura Sloate, the managing director of a Wall Street investment management firm, who seems to have made a complete move towards ‘secondary orality.’ She reads by listening to her text-to-speech software and writes using a dictation software. Although she does regret not spending more time learning to spell in her youth, Sloate is quoted as saying that using Braille would have only isolated her from her sighted peers. “It’s an arcane means of communication, which for the most part should be abolished.” Aviv quotes Sloate again, “It’s just not needed today.”

Highlighting the significance of the decline of Braille on the blind, advocacy organizations, and their attempts of making the blind people literate, Aviv says, “The modern history of blind people is in many ways a history of reading, with the scope of the disability — the extent to which you are viewed as ignorant or civilized, helpless or independent — determined largely by your ability to access the printed word. For 150 years, Braille books were designed to function as much as possible like print books. But now the computer has essentially done away with the limits of form, because information, once it has been digitized, can be conveyed through sound or touch.

Aviv also reports about an annual convention of the National Federation of the Blind on the same issue. Offering the perspective of those representing the organized movement of the blind who want the government to spend more resources on promoting Braille, Aviv says, “For sighted people, the transition from print to digital text has been relatively subtle, but for many blind people the shift to computerized speech is an unwelcome and uncharted experiment. In

grappling with what has been lost, several federation members recited to me various takes on the classic expression *Scripta manent, verba volant*: What is written remains, what is spoken vanishes into air.”

However, there are many reasons why Braille books are falling out of favor. Braille books are expensive and cumbersome, requiring reams of thick, oversized paper. The National Braille Press, an 83-year-old publishing house in Boston, printed the Harry Potter series on its Heidelberg cylinder; the final product was 56 volumes, each nearly a foot tall. Because a single textbook can cost more than \$1,000 and there’s a shortage of Braille teachers in public schools to teach to read Braille in a reasonably competitive speed and accuracy, visually impaired students often find it more convenient to read using MP3 players, audio books and computer-screen-reading software.

Aviv cites a report released in 2008 by the National Federation of the Blind. It said that less than 10 percent of the 1.3 million legally blind Americans read Braille. Whereas roughly half of all blind children learned Braille in the 1950s, today that number is as low as 1 in 10, according to the report. The figures are controversial because there is debate about when a child with residual vision has “too much sight” for Braille and because the causes of blindness have changed over the decades — in recent years more blind children have multiple disabilities, because of premature births. It is clear, though, that Braille literacy has been waning for some time, even among the most intellectually capable, and the report has inspired a fervent movement to change the way blind people read. “What we’re finding are students who are very smart, very verbally able — and illiterate,” Jim Marks, a board member for the past five years of the Association on Higher Education and Disability, told me. “We stopped teaching our nation’s

blind children how to read and write. We put a tape player, then a computer, on their desks. Now their writing is phonetic and butchered. They never got to learn the beauty and shape and structure of language.”

Repeating the same conundrum that also applies to print, Aviv adds, “For much of the past century, blind children attended residential institutions where they learned to read by touching the words. Today, visually impaired children can be well versed in literature without knowing how to read; computer-screen-reading software will even break down each word and read the individual letters aloud. Literacy has become much harder to define, even for educators.”

I would like to apply Derrida’s logic of ‘supplementarity’ to this debate as well. We should reject any kind of demonizing of text-to-speech or any special favor to Braille in order to avoid falling in the trap of privileging one over the other. It is great to know Braille but in this digital age underscored by orality, it cannot remain the dominant mode of reading, let alone the essentialist metanarrative for the blind. When it comes to Braille books in post-structuralist paradigm, there must be a choice for reading Braille books but not a compulsion to read them. In fact, the original source of the book, in its abstract form, is the same for print, electronic, Braille and audio books. Braille books have the same disadvantages as print books: they are difficult to carry, they cause pollution, they lead to deforestation. They also have the same benefits as the print books: the readability is better, they are not dependent on an electronic device. Hence, the debate about the culture of books should have nothing to do with the format of books.

From Literacy to Secondary Orality: Talking Books

As I noted earlier, audio recording technology had started showing positive signs of success in the latter half of the nineteenth century. In 1877 Thomas Alva Edison, working in his lab, succeeded in recovering Mary's Little Lamb from a strip of tinfoil wrapped around a spinning cylinder. He demonstrated his invention in the offices of *Scientific American*, and the phonograph was born. This, and such other successes listed below paved the way for the audio books for the blind, as well as for the age of what has been called 'secondary orality' which reclaimed some lost ground for the spoken word in the academia. Many books, such as *America on Record* provide a history of sound recording, from the first thin sheet of tinfoil that was manipulated into retaining sound to the home recordings of rappers in the 1980s and the high tech digital studios of the 1990s. Yet, a book on how this technology was used to produce books in alternative format is still to be written. Any such book will remain incomplete without a detailed discussion on Edison and his phonograph.

While working on his phonograph in 1877, Thomas Edison predicted that one day there would be a talking machine in every home. But even his legendary vision could not have foreseen that recorded sound would pervade modern life to such a great extent. According to the history of phonograph provided on the "American Memory from the Library of Congress," the patent on the phonograph was issued on February 19, 1878. Edison's invention was highly original. The only other recorded evidence of such an invention was in a paper by French scientist Charles Cros, however, Cros's work remained only a theory, since he did not produce a working model of it.

Edison took his new invention to the offices of *Scientific American* in New York City and showed it to staff there. As the December 22, 1877, issue reported, “Mr. Thomas A. Edison recently came into this office, placed a little machine on our desk, turned a crank, and the machine inquired as to our health, asked how we liked the phonograph, informed us that it was very well, and bid us a cordial good night.” The invention of phonograph was reported in several New York newspapers, and later in other American newspapers and magazines.

The practical uses Edison conceived of his phonograph can now be seen materializing in real life situation, and helping people irrespective of their abilities. Most of the benefits he conceived of are also listed as the benefits of audio books in general, even though Edison thought of audio books only for the blind. Edison offered the following possible future uses for the phonograph in *North American Review* in June 1878:

1. Letter writing and all kinds of dictation without the aid of a stenographer.
2. Phonographic books, which will speak to blind people without effort on their part.
3. The teaching of elocution.
4. Reproduction of music.
5. The “Family Record”--a registry of sayings, reminiscences, etc., by members of a family in their own voices, and of the last words of dying persons.
6. Music-boxes and toys.
7. Clocks that should announce in articulate speech the time for going home, going to meals, etc.
8. The preservation of languages by exact reproduction of the manner of pronouncing.

9. Educational purposes; such as preserving the explanations made by a teacher, so that the pupil can refer to them at any moment, and spelling or other lessons placed upon the phonograph for convenience in committing to memory.
10. Connection with the telephone, so as to make that instrument an auxiliary in the transmission of permanent and invaluable records, instead of being the recipient of momentary and fleeting communication.

Edison's invention of phonograph, the way it became the precursor for audio books, helped people with print-disabilities with the metaphorical light of knowledge and information. Interestingly, Edison stopped his work on the phonograph for a while to concentrate on inventing something that gave everyone the real light, the incandescent light bulb. Other people, such as legendary Alexander Graham Bell and Charles Sumner Tainter, improved on his phonograph technology. Having succeeded in making the incandescent lamp, Edison resumed his work on an improved version of phonograph. In 1888 the New Phonograph came in to being, it was an electric motor-driven device.

The true history of audio books starts in 1933, when American Foundation for the Blind (AFB) produced two types of recording machines to record talking books for the blind. Experimentation on the development of sound recordings for the blind had begun many years earlier. Aided by the Carnegie Corporation, AFB and the Braille Institute of America had been researching the development of suitable records and reproducers. But there was no major success till 1933.

One of the two machines that AFB produced was spring driven and the other was a combination of electric radio and phonograph. A durable record was perfected, recorded at 150

grooves to an inch, so that a book of 60,000 words could be contained on eight or nine double-faced, twelve-inch records. The turntable ran at 33-1/3 revolutions per minute, which permitted thirty minutes of reading time on each record.

By 1934, the talking book was developed. Among the titles chosen for the first orders of talking books were Washington's *Farewell Address*; Lincoln's *Gettysburg Address*; Shakespeare's *As You Like It* , *The Merchant of Venice*, and *Hamlet* ; Kipling's *Brushwood Boy* ; and Wodehouse's *Very Good Jeeves*.

The Library's appropriation did not at first include funds for machines; they had to be purchased at a cost between thirty-five and sixty dollars, either by the blind person who desired to borrow the recorded books or on his behalf (as was frequently the case) by philanthropic organizations.

This problem got resolved after an amendment to The Pratt-Smoot Act. In 1935 a venture was initiated to meet the need of blind adults who could not afford to purchase talking-book machines and to provide employment to those receiving financial assistance from the government as a result of the Great Depression. President Roosevelt allotted \$211,500 to the Works Progress Administration (WPA) for the construction of 5,000 talking-book machines "or the purpose of enabling the blind to use the books now provided by the Library of Congress." The basic Act of 1930 was amended several times, not only increasing appropriations, but also deleting the word 'adult,' on July 3, 1952, thus opening the service to blind children. And in 1962, the program was authorized by Congress to collect and maintain a library of musical scores and instructional texts for the use of blind residents of the United States.

Initially the law did not allow NLS to provide books to print-disabled individuals who were not blind. Blindness is only one of the disabilities that make a person unable to read printed media. Some individuals who have lost the use of one or both hands are unable to hold a book or magazine or turn pages. Others whose visual disability does not meet a strict definition of blindness still cannot see well enough to read standard print.

By the end of fiscal year 1966, Congress passed Public Law 889-522 authorizing the Library to provide talking-book services to all persons who could not read standard print because of visual or physical disability. The revised law brought an immediate need for an expansion of program activities. To accomplish this, the book collections in NLS/BPH and those in the more than forty established regional libraries were strengthened by building a reserve collection of books and increasing the number of copies of recorded and Braille titles produced.

With the passage of 889-522, a larger number of people started accessing books through their ears. Popularity of talking books, as I demonstrate in the next chapter, was on the rise even with the people who were not considered disabled. However, till the end of the twentieth century the primary users of audio books were people with print disabilities. For the most part, people with recognized disabilities and those without them access talking books on separate platforms.

Print-disabled NLS patrons can play talking books on specialized assistive technology devices. They currently cannot play their books on any mainstream device. As audio cassettes disappeared from the market, NLS came up with specialized cartridges for talking books. These cartridges are based on flash memory, are more durable and are easy to use. But they can be played only on the player distributed by NLS, or on the players authorized by NLS. NLS allows

books to be played only on the assistive devices designed for the purpose of the blind and print disabled individuals.

The patrons can now download books directly to their computer but can't play them on it. One explanation for why these books can be played only on assistive devices may be the problem of copyright violation. However, copyright applies to all audio books distributed, for instance, through state libraries. They are copyright protected but they can be played on computers and some other off the shelf music players that can handle Digital Rights Management (DRM) protection.

This issue leads us back to the segregation of the technology used by the disabled. It is not that the system allows the disabled to use assistive technology, the problem is that it imposes assistive technology on them. This kind of imposition is against my idea of 'universal access.' The assistive technology approach not only segregates, it adds a substantial additional cost to an already expensive program.

Problematizing Assistive Technology

Andrew Feenberg, in his *Questioning Technology*, outlines the conundrum of questioning technology. The methodological dualism of technique and meaning has political implications. "On the one side, technology undermines traditional meanings or communicative action, while on the other side we are called to protect the integrity of a meaningful world." This dilemma can be explained by revisiting the New York Times article, "Listening to Braille," discussed earlier in this chapter.

The bottom line of the article was that because blind individuals, empowered by technology, are increasingly “listening to Braille,” there seems to be an uproar among the traditionalists in the blind community. The traditionalists here signify those who want blind children to learn Braille and adults to keep using it. Braille for them is integral to the meaningful world of the blind. And they would not let technology corrupt it.

The problem I am baffled with has, probably, to do with the terminology: Whether the traditionalists in the blind world should blame technology for undermining the tradition? Or should they blame assistive technology? After all, those who are renouncing Braille reading for synthesized speech on their computers are using what has been defined as assistive technology.

Moreover, can we say for sure that Braille is not a technology? We can surely find the etymological connection between Braille and technology. Bolter explains in his *Writing Space* that Greek root for technology is ‘techne’ which means writing, as well as some other skills. Braille was the first system that enabled the blind to write and read it back independently. Because it was used by the blind, should it be called ‘assistive’ technology?

The term ‘technology’ is so muddled that even simple alphabet system has been called technology. After all, the letters in the alphabets are the building blocks of ‘techne’ or writing. Can the concept of assistive technology be as straightforward, as it is muddled in the case of nonassistive technology? Can it be sufficient to define assistive technology in the established way, as technology used by people with disabilities? Isn’t the whole point of ‘techne,’ as we are told by the dialogue in *Phaedrus*, to assist human beings? If it is so, isn’t all technology assistive technology? These are some pertinent questions regarding the term ‘assistive technology’ that have hardly ever been asked, let alone answered.

As Feenberg illustrates, technology, for the most part, has remained unchallenged. *Questioning Technology*, as Feenberg does in his book, is a fairly new and uncharted territory. “If the human significance of technology is largely unmapped territory,” explains Feenberg, “this is mainly due to the idealism of Western higher culture. Only recently have scholars outside the technical fields become interested in their problems and achievements.”

In earlier times, Feenberg explains, the humanities rejected discourse on technology as unworthy. That tradition goes back to the ancient Greeks who lived in aristocratic societies in which the highest forms of activity were social, political, and theoretical rather than technical.

Humanist scholars, we are told, first took technology seriously only in the modern period, especially with the publication of Diderot's *Encyclopédie*. However, as Langdon Winner in his “Do Artifacts Have Politics,” explains, modern political theory subsumed technical activity under the economy and did not raise the same kinds of issues about rights and responsibilities in relation to it that are considered relevant to the state.

The same is true about assistive technology for the blind. The advocacy organizations, rehabilitation specialists and other organized movements of the blind have raised voices for accessibility of social, political and technological realms, but they seem to be apathetic about the assistive technology market. The National Federation of the Blind, for instance, never seems to be questioning the devices sold with the label of assistive technology. Take, for instance, Braille Note Apex, a device about the size of a PDA. It is advertized as something more than a computer. It is more than a computer in the sense that it has a small Braille display. But when it comes to word processing, browsing on the internet, or social networking tools, it is less than the first windows based computer. It comes with a warrantee of one year, extending it for another

year costs almost as much as a new computer. Of course, the cost makes it more than a computer. It costs close to \$6000.

There are other devices like Braille Note Apex that do as little as Apex does, and cost as much as well. The other thing that makes Apex more than a computer is that, whereas a computer cannot play audio books prepared by National Library Service, Apex can. Other assistive technology devices can also play them. There are three main players in the assistive technology market that can play the specialized format after NLS authorizes them. They are manufactured by different agencies, and are sold as digital book players. They all cost more than their counterparts in the regular market such as Kindle, Nook and Sony E-Reader. None of the assistive technology players can play the mainstream book with DRM protection, let alone download them.

These assistive devices should be rather compared to off the shelf mp3 players, and often these mp3 players deliver more than the assistive technology players. Most of these mp3 players come equipped with special audio book playing programs. They are less expensive, more compact and have more features. Only thing they don't allow for costing ten times less than the assistive technology player, is read the text based files. Assistive devices come equipped with text-to-speech software that allows print-disabled users to navigate through files and access digital content independently.

The only mainstream player that has built in speech to read the text aloud is Kindle. Apart from text-to-speech, the reason why Kindle became such a focus of attention in 2009 was because of Amazon's aggressive efforts to have it accepted in universities and schools as an alternative to paper based text books. In the following section I will discuss the implications of a

mainstream player having text-to-speech. The reason why the mainstream book readers do not have text-to-speech is the belief that only blind people use speech to operate electronic devices. As a device that was not meant for the blind, Kindle challenges that belief. Kindle will also be a great entry point for the critique of Universal Design Principles.

Kindle, a Twist to Kindled Hopes

When Amazon released the latest upgrade to their e-book reader, Kindle 2, many hopes, especially those of the bookworms who are blind, were rekindled. Even though Kindle originally could play audio files, Kindle 2 was way ahead in terms of speech. It had a built in text to speech software preinstalled that could read any text in the book aloud. In other words, with this version of Kindle, any user could access a text-based book as an audio book at will. Kindle 2's capability to convert any text-based book in to an audio book is indicative of the significant inroads the audio books have made among the readers. (More about this in the next chapter.)

Because Kindle was a book reader and it could read the books aloud, should people with disabilities needed it, it could be assumed that Kindle is accessible to the blind as well. Probably because of that belief, it was in early 2009 that some Universities in collaboration with Amazon decided to run a pilot program to test Kindle e-reader as a viable option for paper based text books. Some of the courses were supposed to make it completely paper free. The pilot program was to start in Fall semester and required all students of the experimental course to use Kindle to download and read text books. It sounded like good news to environmentalists as it would save millions of trees from being cut and used for making papers. Those concerned with uncontrolled

hike in the cost of text books also had reason to celebrate. Electronic books would not cost as much as paper based books do.

Moreover, Kindle based classes also appeared very close to the principles of Universal Design for Learning (UDL) principles to the champions of universal design. Enunciated by Center for Applied Special Technology (CAST), these principles have been adopted by certain schools, but they have, more or less, remained hidden within the pages of books and academic research papers. CAST began exploring, way back in the 1980s, how to use new technologies to expand educational opportunities for “learners of all abilities.”

Universal design of learning argues for multiple means to communicate information “to adjust to the recognition needs of all students, including children with learning disabilities, visual or auditory impairments, physical disabilities, and diverse learning preferences” (Rose 13). It has been the biggest challenge for schools to make textbooks accessible to people with print disabilities. So, when some schools decided to move to Kindle, a device that could contain thousands of books and could read the text aloud if required, it should have been considered a serendipitous, yet, the biggest victory for the advocates of UDL principles.

However, it was not to be. The organizations of the blind declared that such a move was a violation of blind people’s civil rights. They threatened to take legal recourse in order to stop these schools from making this move to electronic text only courses. As we now know it, the Department of Justice was forced to swing in to action and declare that requiring in a course, a device that people with disabilities could not use, was against the spirit of Civil Rights and Americans with Disabilities Act. As a result, the schools were told not to go on with their plans to use Kindle exclusive books for their courses. The aggressive movement spearheaded by the

advocacy organizations working for the blindness related issues succeeded in communicating to schools that a device that was not accessible to certain individuals was not an acceptable replacement for text books. Such a movement put tremendous pressure on the manufacturers of the device, Amazon, who finally agreed to work with such organizations to ensure that the next version of Kindle would be usable by the blind.

The problem with Kindle was that, contrary to what champions of Universal Design believed, it was not accessible to the blind users. Its manufacturers ignored the basic principles of Universal Design. Because it could make available to the print-disabled the same books, at the same time and at the same price as to anyone else, it was in the spirit of universally accessible design. But, just being able to read the books is not enough for accessibility. Because blind students could not access the menus to operate it, it was, in fact, against the spirit of Universal Design. If the manufacturers had given a thought to the issues of universal accessibility from its very inception, this whole showdown could have been avoided, and Kindle would have become an important tool for reading text books. However, Kindle is only one of the millions of devices that ignore UD principles. As a result, the industry ends up losing some valuable customers.

Kindle came to this avoidable limelight, as Amazon tried to transform university textbook policy in some schools. Since Amazon is in the business of selling books, this drew more attention. There is no other electronic book reader, I should specify, that offers accessibility to the print disabled individuals. Among the available electronic book players, Kindle 2 is the most accessible of all, thanks to its text-to-speech feature.

On the other hand, one may also find problems in the Universal Design principles, for Amazon's misunderstanding of Kindle as an acceptable device for people with multiple abilities.

But before exploring the flaws in the UD principles, we will have to go deeper in to this philosophy. In the following paragraphs I will briefly discuss theory of Universal Design (UD) and Universal Design for Learning (UDL) principles. I will attempt to demonstrate how accessibility of textbooks can be truly enhanced by a philosophical commitment to the principles of universal accessibility. After all, the product needs to be accessible, not only the design of the product.

Universal Design: From Principles to Problems

As Roberta Null and Kenneth Cherry explain in their *Universal Design: Creative Solutions for ADA Compliance*, Universal Design (UD) is an architecture-related concept that underpins a commitment to making “the built world - its interiors, exteriors, products, and furnishings - so that it will be usable for all people” (ix). Significantly, this commitment to usability governs the design of a building and its furnishings from its conception. “What makes the interiors or exteriors accessible is not retrofitted but built in, imagined and designed from the beginning to be accessible” (Dunn and Dunn).

UD focuses on diversity of individuals, and their divergent needs that are not static, and challenges “one design fits all” concept. I will demonstrate later in this paper how Kindle, along with several other electronic devices, could use UD principles to benefit not only the print disabled individuals but other individuals as well, especially in situations where print enabled individuals are not able to read text. It may happen while driving, ironing, relaxing in the pool with their eyes shut, and similar situations.

The concept of universal design first arose in design of the built environment, where it was employed to market homes. “A universally designed home is one that young children and senior citizens alike find comfortable and convenient, yet adolescents and working-age adults also find appealing” (Bowe 4). As people aged, they would feel no need to move, because the house posed no barriers to them.

Frank Bowe in his *Universal Design in Education: Teaching Non-Traditional Students* informs that UD was initially conceived as a marketing theme. Later on it adopted the idea of accessibility “which carries connotations of disability and of government-mandated design features” (6). It presented the idea of accessibility as something that appeals to all of us, “as an approach that we would elect to use because it responds to our enlightened understanding of diverse needs” (8).

Ron Mace, founder of the Center for Universal Design (CUD), and his colleagues at North Carolina State University, believed that if usability could be marketed to the general public as convenient, it would sell itself. “People who try wide-grip scissors or other kitchen utensils, such as Friendly Fit™ forks and spoons, that are sold in Home Depot and Williams-Sonoma household supply stores, often prefer them to conventional implements: they just feel better ... if he (Ron) could present universal design so that people would voluntarily adopt it, the world would become a much more livable place for all of us” (10).

As we know, the world still has scope to become more livable for all of us, that UD principles are not universally recognized yet. As we move towards digital technology in our gadgets and implements of daily use, the accessibility is being given a short shrift by the manufacturers. Needless technological innovation is the order of the day. Aesthetic

considerations in the design of the products are leaving no time for designers to think about usability. Kindle and other electronic book readers are products of this misguided market.

In a recent review of a new Android phone, a New York Times editorial piece suggested that there was no engineer above the age of 40 working for Google. The reviewer was commenting on the small size of the lettering on the new phone, which is undecipherable for the users, unless they have perfect vision. The commentator was unwittingly stating that Google engineers, the designers of the Android phone, did not follow the principles of UD. In the case of a blind user, the size of the lettering does not matter, as in either case the phone would not be accessible without the help of assistive technology. In other words, increasing the fonts size on the new Android phone will make the phone accessible to the New York Times commentator, but it will still leave a prospective blind user still in the lurch until a screen reader for the phone is developed. I will later discuss this as a problem with the Universal Design principles. There is a common agreement among the UD theorists that if a device, like a smartphone, allows platform for development of an accessibility solution for that device, it is within acceptable as the accessible design.

Among several definitions of the term ‘universal design,’ Bowe draws our attention specifically to the definition found in the Assistive Technology Act (ATA) of 1998 (PL 105-394). According to this definition, the term ‘universal design’ means a concept or philosophy for designing and delivering products and services that are usable by people with the widest possible range of functional capabilities, which include products and services that are directly usable (without requiring assistive technologies) and products and services that are made usable with assistive technologies. In this context ‘assistive technology’ means the technology that makes a

product accessible for people with disabilities. Here is the main problem with UD. Since assistive technology caters to very few individuals, it often costs much more than the product it makes accessible. An average computer, for instance, costs around \$350, but the screen reading software that makes it accessible to the blind costs about \$1000.

Whereas the Android phone is an open device for which assistive technology (screen reading software) can be designed, electronic-readers like Amazon are closed systems which will not become accessible unless accessibility features are built in the device itself. That a cell phone is not accessible to the blind without developing or paying for a screen reading software is bad; it is worse that electronic book readers, like Kindle, can't be made accessible even with assistive technology. Bowe illustrates in his book that one big advantage of universal design is that it minimizes the need, on the part of people with disabilities, for assistive technology devices and services.

Nonetheless, as this definition allows, universal design will not meet all needs of all people--some persons will still find some environments to be hostile and so will need assistive technology products and services. That is why universally designed products and services must also be compatible with widely used adaptive equipment.

In findings and purposes section of the ATA the following explanation appears as statement 10: The use of universal design principles reduces the need for many specific kinds of assistive technology devices and assistive technology services by building in accommodations for individuals with disabilities before rather than after production. The use of universal design principles also increases the likelihood that products (including services) will be compatible with existing assistive technologies. "These principles are increasingly important to enhance access to

information technology, telecommunications, transportation, physical structures, and consumer products” (Bowe, 26).

It should be made clear though that ATA does not legally require educators and designers to follow UD, the law is primarily about assistive technology, discussion on UD is more to raise awareness about the concept of Universal Design.

The main reason why many products remain inaccessible is that the designers are not aware of the difference between assistive technology and Universal Design principles. Because of the binary logic that prevails throughout the society, it is believed that the needs of disabled and non-disabled are completely different from each other. It is a given that a product cannot be used by a blind person without the use of assistive technology. Such erroneous belief is a product of a philosophy that subscribes to the binary opposition between able bodied and disabled. This assumption propounds “one design fits all” approach, where ‘all’ means all ‘normal’ individuals. Designers of Kindle and other electronic book readers apparently believe in the same philosophy. Such an approach is the primary hurdle in the path of universal accessibility.

Several scholars, including Rose, Meyer and Bowe, have compared the two approaches: one is exclusive, the other is inclusive. The inclusive approach of UD has several important advantages over exclusive approach of assistive technologies. It is usually far less expensive than traditional steps that are required in the other approach. Braille or tape-recording of texts, and in-classroom sign language interpreting, the exclusive approach, is expensive. The State of California, in Fall 1999, ordered textbook publishers that sell texts to California schools to make available, as well, disk versions of the texts (Assembly Bill AB 422). Texts on disks can be converted to audio files and listened to by students who are blind and by many who have

learning disabilities. When exams loom, the sighted students discover that they may also listened to those audio files while driving. This is where inclusiveness of UD illustrates itself.

Retrofitting the class curriculum to accommodate an unexpected student is not the best solution; a lot of students will benefit if the teacher from the very start builds accessibility in the curriculum. According to David Rose, the difference between assistive technology and universal design is that the former focuses on an individual adapting to a rigid curriculum, while the latter focuses on curriculum designed from its inception to be flexible and inclusive. The same principle applies on a product like Kindle e-book reader. Amazon would have saved a lot of time and resources if they didn't have to retrofit the reader to suit the needs of the print disabled.

In 1995, the Center for Universal Design brought together ten designers, engineers, researchers, architects, and advocates to articulate seven key ideas behind the concept of "universal design" (Bowe 3). This process leads to seven principles of universal design. I will briefly discuss these principles and evaluate Kindle reader in light of them. To expect all principles in a device will not be rational. Which of the principles apply depends on the product.

The design can be used by, and marketed to, all kinds of people. As we discussed earlier, Kindle is not one such device. Its latest version can be marketed to print disabled people with the argument that it contains text to speech. But it can't be used by them without assistance from a sighted person. Having said that, because the main objective of the Kindle reader is to read books, and it does read the books aloud when needed, it meets the marketability to all principle.

The design incorporates a wide variety of preferences. People have choices in how they use it. Kindle does a good job in this regard as users can adjust font size and brightness of the

screen. If they want they can read the text on the screen. Or they can use the text to speech engine to have the text read aloud to them.

The product or service is easy to understand and use. It avoids unnecessary complexity. Once you can access the menu, the software design is intuitive in the case of Kindle. People with reasonable knowledge of electronic gadgets find it easy to use.

It works in all kinds of settings. Kindle has a built in 3G connection. It allows users to download books anywhere they want to. It is battery operated so users don't have to stick to any specific place to use it. With the text to speech engine, users can read books even when their eyes are occupied with other things. So Kindle does justice to this principle as well.

The design accommodates error. People can make a mistake without disastrous consequences. Like any other computer based device Kindle confirms before it executes any command involving deleting or formatting.

The product or service requires minimal effort to use. Neither intense nor sustained physical effort is needed. Kindle does a commendable job in this regard as well. You don't have to be too technical or brainy or physically strong to be able to use it.

It accommodates variations in size and position. People can use it while standing, sitting, or reaching. No complaints there too. Kindle is very light weight. Its small size ensures that there is no problem in holding and operating it for any individual. People with dexterity problem can operate Kindle without much effort.

That Kindle adheres to principles of UD does not mean that designers of Kindle were thinking about these principles. Similarly it can be said that Kindle was not designed to be accessible to the blind because the manufacturers did not want to adhere to the accessibility

principles. As Tobias tells us, more than design UD suffers from lack of information. Tobias considers nontechnological reasons more responsible for lack of accessibility. In the context of Kindle too, Tobias seems to be correct.

Vanderheiden and Tobias conducted a three-year study of industry views and practices about UD. Based on the interviews, survey results and observations of industries throughout the world, it can be said that UD activists will have to cover a lot of ground to dispel doubts and misconceptions prevalent about UD. The study suggests that most of them think UD is meant for disabled people only. The awareness was more strongly felt in Europe and Japan than in the US, where Kindle was designed and manufactured.

It is expected that with time electronic book readers will be designed with an accessible menu commands. The reason for such expectation is what I call “onslaught of orality.” When Kindle was first introduced nobody knew that very soon there would be another version of it with text to speech software. Now that users can access the texts by nonvisual means, there is hope that menus will be available to access without having to look at the screen. The technology is definitely there to make that possible. In the next chapter I will argue for the oral means for operating a device. With the evolution of technology, it will be possible to verbally tell or physically gesture to the electronic device to perform the desired action, and it will be able to follow the verbal commands. I will try to establish that ‘secondary orality’ will be the tool to enable universal access on all electronic gadgets, devices and appliances.

CHAPTER FOUR. SECONDARY ORALITY: THE PATH TO UNIVERSAL ACCESS

In the previous chapter I established the irrelevance of a fixed body for the book. This discussion was in continuation with my deconstruction, in chapter two, of the idea of ‘normal’ human bodies and my conceptualizing of a post-disabled world. Whereas in chapter two I conceptualized decorporealized existence of human beings, in chapter three I historicized the evolution of book in to abstract form which can be supplanted on to multiple kinds of bodies, namely Braille, audio, and hypertext.

I elaborated upon how the content of the book has been extracted in the past from the book and been transplanted on to alternative bodies to benefit the print-disabled. With the time and evolution of technology, print book lost favor among the sight dependent readers. Hypertext became the new normal and the many sight dependent people started reading books on alternative bodies. I discussed Kindle e-book reader as the example of the alternative body of books for those readers.

The possibility of accessing the content of a book in electronic format on a talking device like Kindle was good news for people with print-disabilities, but, because of Kindle’s inaccessibility to such users, its benefits remained restricted to the people who could read print on their own. Thus the print-disabled remained segregated from the mainstream books. Their dream of being able to acquire the same books, at the same time and at the same price did not materialize. I also established a link between assistive technology and universal design principles and argued that the two are partially responsible for this fiasco in addition to Amazon’s rigid approach about the issue of accessibility of Kindle.

In this chapter I will explore the concept of ‘secondary orality’ to demonstrate that we are already living in the age of ‘secondary orality.’ I will argue that ‘secondary orality’ will help materialize the ideal of universal access that would help a level playing field for people with print-disabilities. I will also try to establish that the victory of literacy over orality in the age of Plato lead to ocularcentric bias and rendered the blind disabled. My ultimate goal in this chapter will be to propose a common platform that can be used by people of all kinds of abilities for accessing information.

The historical overview I presented for the books for the blind in the previous chapter demonstrates that the reading platforms have developed separately, for those who are print-disabled on one hand, and those who are not, on the other. Disembodiment of the book from its print format was considered obligatory in order to provide reading material for the print-disabled. The print-disabled could not read books on their own, unless those books were available in alternative formats accessible to them. For those who can read the print on their own, the electronic format of a given book was always optional. Yet, popularity of electronic book readers like Kindle has given some concern to the lovers of traditional print books as to whether print book will be able to sustain the onslaught of hypertext and electronic book readers, and if the print format will manage to survive, even if as an optional format.

Similar concerns have been raised about the future of Braille books. Because of the limitations of Braille, many blind readers have stopped using Braille altogether, and they are making use of the text-to-speech technology that reads the text aloud to them. In fact, even sight-dependent readers are also increasingly moving towards listening to text. Sensing that trend,

manufacturers of Kindle decided to experiment with text-to-speech technology. The TTS option in the latest edition of Kindle has become very popular since then.

It is not just the text-to-speech on Kindle that sight dependent people are embracing increasingly; they have started listening more frequently to many other kind of sounds that are mediated and facilitated by technology. Despite the discovery of the possibility of making use of text to speech conversion software to achieve a neo-verbal communication, the human voice is not taking a back seat. Quite the contrary, the human generated voices are being used on several websites to greet visitors. Moreover, the human voice is traveling through the net more often than ever. All the electronic chat clients now allow the use of voice chat, a feature very popular with netizens. You just need a computer with microphone and speakers and Internet connection to talk to someone in a different part of the world— and virtually for free! Traditional audio books and podcasts are being downloaded and heard by people from all walks of life.

Today almost all electronic gadgets come with some kind of audio attached. Washing machines announce all the steps until one gets the laundry out of the dryer. There are microwaves with speech output. There are coffee machines that can be verbally instructed to prepare coffee and they will let you know when the beverage is ready. There have been talking watches, talking thermometers, talking calculators around for a while. There are massage chairs which talk as they give the customer massages. There are anti-virus programs with built in speech. GPS devices talk one in to follow a specific route. And there are hoards of devices, which I will discuss further later, that can read the text on the screen aloud. Moreover, another technological artifact with audio that I will discuss later on is talking books that has been in existence for quite sometime now.

The Age of Secondary Orality

It is evident that after “the explosion of the electronic age,” to use McLuhan’s words, we have started using our ears more often and more frequently. Marshall McLuhan and Walter Ong did predict our returning to the preliterate age. We have definitely left that age way behind to return to that. Their comments should be understood only in relation to the predominance of speech in various human activities.

In his 1982 book *Orality and Literacy: The Technologizing of the Word*, Ong proposed the term ‘secondary orality’ for the speech borne or produced by technology. He primarily attributes the communication technology for this phenomenon. The emergence of ‘secondary orality,’ he suggests, is taking place through the use of telephone, radio and television. And later on, in the book, Ong adds various kinds of sound tape to the discussion of secondary orality (133).

Yet, his explanation of this concept goes way beyond telephone, radio, television, or sound tape for that matter. The electronic age is, Ong explains, “also an age of ‘secondary orality,’ ... which depends on writing and print for its existence (3). After Ong’s elucidation of this concept, the electronic age has brought forth many other forms of orality that is based on print and writing for its existence. I will mainly discuss digital audio books and podcasts as the forms of secondary orality that owe their existence to print and writing.

Walter Ong could perceive a kind of transformation in our thinking with the arrival of electronic media. He said that interest in the written word would diminish allowing an upper hand to the spoken word. The basis for this suggestion primarily was the non-linear structure of an oral culture, also to be found in the structure of the internet. To quote Anet Dekker, “He

believes the possibilities of interactivity in ‘hypernarratives’ in which various pieces of text, images and/or sound fragments are connected with one another by means of links, reflects the oral tradition.”

Secondary orality is, as Ong explains, “both remarkably like and remarkably unlike primary orality. Like primary orality, secondary orality has generated a strong group sense, for listening to spoken words forms hearers into a group, a true audience, just as reading written or printed texts turns individuals in on themselves.” On the other hand, Ong says, “Secondary orality generates a sense for groups immeasurably larger than those of primary oral culture” (133).

Continuing the comparison between two kind of oralities Ong adds, “Before writing, oral folks were group-minded because no feasible alternative had presented itself. In our age of secondary orality, we are group-minded self-consciously and programmatically. The individual feels that he or she, as an individual, must be socially sensitive. Unlike members of a primary oral culture, who are turned outward because they have had little occasion to turn inward, we are turned outward because we have turned inward” (134).

On the basis of the description above, Ong appears to be giving people agency on how we get impacted by secondary orality, or any other phenomenon for that matter. However, some scholars have argued that it is the technology and the market that determines how we function on the face of a new technological phenomenon. The concept of technological determinism doesn’t leave agency with the users. Although this is a debate worth looking in to, it does not fall within the framework of my current project.

It has been about 30 years since Ong propounded the concept of secondary orality, and the predominance of such literacy is continuing to wear off. The ascendancy of Orality and/or Aurality is so palpable in the society that William Crossman in his *Voice-in-Voice-Out: The Coming Age of Talking Computers* has declared the end of the written word by 2050. He suggests in his book that by 2050 we will be able to accomplish all our tasks without reading or writing. It will be possible to give commands to the computers verbally and the output from the computer will be only through audio.

So what are the reasons behind this impending audio revolution? According to Crossman four engines are driving us:

1. Evolutionarily/genetically, humans are hard wired and driven to speak.
2. Technologically, humans are driven to develop technologies that allow us to access information by speaking and listening. Also, text/written language, being an ancient technology for storing and retrieving information, will get replaced - as do all technologies - by a newer technology that does the same job more efficiently, quickly, and universally.
3. Young people in the electronically-developed countries are, en masse, rejecting text as their technology of choice for accessing information in favor of speech-driven technologies.
4. The billions of functionally non-literate people worldwide want access to information, including the Internet and World Wide Web, without having to learn to read and write.

Crossman's predictions about the world without written word by 2050 does seem farfetched, however, it can be demonstrated with examples that the literate people in developed countries are making use of the speechbased technology. I have already discussed the popularity of text-to-speech software on Kindle e-book reader. As far as controlling electronic devices with speech is concerned, the designers of communication devices had started taking baby steps toward that direction long back. The computer operating systems have a basic text-to-speech program and voice recognition feature.

The Siri application on iPhone was a giant leap towards the age of talking computers. Siri became the main selling point for the latest version of iPhone, iPhone 4S. It is the best example of artificial intelligence on a cellular phone. Siri understands questions like, do I need a jacket today? In human sounding voice it speaks out the answer that includes the expected temperature for the day. Siri understands commands like text my wife that I will be late today. The iPhone blogosphere is full of posts discussing the possibilities of Siri being installed on the older versions of iPhone, on which this application is currently not available. These discussions accentuate the overwhelming popularity of this application, and, in turn, that of the technology driven orality.

For people with print-disabilities Siri came as another tool towards universal access. A touch screen device was anathema to people who couldn't see, or couldn't see well enough, before iPhone came up with secondary orality solutions. But now they don't have to read the screen to be able to use iPhone. They can give it verbal commands and receive output in a human sounding voice. Siri on iPhone is thus far the best example of universal access of information for print disabled.

The main rival of Apple iPhones, the Android based phones have also started boasting about such features on various devices. Android supporters often argue that Siri kind of functionality came to Android based phones before it came on iPhone 4S. This debate aside, this popularity of text-to-speech and voice recognition features on iPhone and other communication devices suggests that Crossman may not be that wrong about his prediction. We may end up in an audiocratic society very soon, unless we are already there. This possibility makes the study of orality more urgent than it is regarded in the academia.

Why Study Orality?

If orality is going to become as important as it was in the preliterate age, it deserves closer attention from the days of primary orality. Many scholars have argued in favor of studying orality, which was neglected after the emergence of literacy. As stated before, Ong in his *Orality and Literacy* demonstrates convergence and divergence between preliterate and postliterate orality. He speaks in favor of studying primary orality to be able to better understand the world of literacy and secondary orality. “A deeper understanding of pristine or primary orality,” Ong argues, enables us better to understand the new world of writing, “what it truly is, and what functionally literate human beings really are: beings whose thought processes do not grow out of simply natural powers but out of these powers as structured, directly or indirectly, by the technology of writing.”

Further, outlining the unavoidable influence of literacy in our everyday activities, Ong argues, “Without writing, the literate mind would not and could not think as it does, not only

when engaged in writing but normally even when it is composing its thoughts in oral form” (78). More than any other single invention, Ong claims, writing has transformed human consciousness (78).

Shankuntala Rao, in her study of orality in the Indian context, linked orality to basic human perception to argue in favor of studying orality and oral knowledge. She finds her argument in favor of studying orality and oral nature on Donald Lowe’s views on speech and sound. Lowe, in his *History of Bourgeois Perception* extols sound and speech and puts it on a higher pedestal than sight.

“Of the five senses,” Lowe argues, “hearing is most pervasive and penetrating.” In his view, sight is always directed to what is straight ahead, not too far and not too close, for otherwise one can no longer see clearly. “And sight cannot turn a corner, sound comes to one, surrounds one for the time being with an acoustic space, full of timbre and nuances. It is more proximate and suggestive than sight. Sight is always the perception of a surface, from a particular angle. But sound is that perception able to penetrate beneath the surface...Therefore, the quality of sound is fundamentally more vital and moving than that of sight” (6). Thus, Rao reasons, if sound and speech are fundamental aspects of perception (and therefore culture) there is an immediate need to study orality and oral knowledge (21).

In addition to Walter Ong, the other author who has contributed significantly to the understanding of orality and oral knowledge is Eric Havelock. Like Ong, Havelock studies the interaction between orality and literacy. In his books, *Preface to Plato* (1963), *Origins of Western Literacy* (1976) and *The Muse Learns to Write* (1986), Havelock highlights the crisis that occurred when orality in Greek culture was transformed into literacy. Rao suggests that the

oral-literate equation, that Havelock investigates, is no longer just a Greek equation but rather a larger ethnographic question for all societies to consider.

“It is not enough to say that Greeks were the ‘only’ ones to be transformed by the logic of writing or that studying Greeks would be enough to reach conclusive statements about orality/literacy interaction in general. However, Havelock remains an important thinker primarily because he was able to document the texts of the Greek plays, both tragic and comic, and philosophical texts as signals of an important cultural change” (Rao 14). The texts indicated that the singing, recitation and memorization (all oral dimensions) and reading and writing were coming into competition and collision.

Havelock points to the fact that we have to use language to think about it, as the biggest difficulty in thinking about language. He provides a different angle to ‘intelligence’ in his characterization of the oral sources of ‘Hellenic intelligence.’ He underscores a specific meaning of intelligence as superior memory and superior sense of verbal rhythm. This kind of oral acoustic intelligence or retentive power, Rao believes, made Plato antagonistic to the earlier Homeric orality. In Havelock’s view, the Greek sense of beauty, painting, poetry, sculpture, and architecture, which were primarily oral, was in a sense elastic and fluid. This supposed drawback in the competition of culture, namely the non-literacy of the early Greeks, was in fact their main advantage because the Greeks were then able to perfect their acoustic, verbal and musical rhythm during the supposed ‘dark ages’ of primary orality.

Another author who has made a significant contribution to the literature about orality is Harold Innis. In his books *Empire and Communication* (1950) and *Bias and Communication* (1964), Innis demonstrated ‘time-bound’ (oral) and ‘space-bound’ (written) cultures as two

different ways of organizing knowledge. The oral cultures (especially the early Byzantine Empire) are examples of tight, hierarchically organized cultures in which monopolies of knowledge produced time-bound and traditional societies.

Later cultures, however, dominated by the use of written, easy-to-transport media such as parchment and paper, developed biases toward the present and future rather than the past, toward nationalism rather than isolationism, towards politics rather than religion (Rao 19). Innis saw the rise and fall of civilizations, especially empires, in terms of a dialectic between competing monopolies of knowledge based on the temporal or spatial bias.

Innis constantly lamented the loss of the 'temporal' and oral dialectic in Western civilizations and showed his own bias for orality when he wrote in *Empire and Communication*: "The oral dialectic is overwhelmingly significant where the subject matter is human action and feeling, and it is important in the discovery of new truth but of very little value in disseminating it. The oral discussion inherently involves personal contact and a consideration of the feelings of others, and it is in sharp contrast with the cruelty of mechanized communication and the tendencies which we have come to note in the modern world" (57).

Innis' writings influenced some of the most prolific literature from Marshall McLuhan. McLuhan took a new cultural stance by beginning his examination of the popular culture with an urgency and awareness of the media environment as a basic force for shaping modern sensibility (Rao 20). Innis' historical and economic studies provided McLuhan's thoughts the intellectual legitimacy on social change, especially in his two influential texts, *The Gutenberg Galaxy* (1962) and *Understanding Media* (1965).

McLuhan points to the polarities between the sensory lives of pre-literate (ear-oriented) and literate (eye-oriented) societies. In the ear-oriented culture 'acoustic space' prevailed where perception was linked to the ear with an interplay of all other senses. On the other hand, the 'visual space' characteristic of the literate person focused on the particular and abstracted it from a total situation. Thus, McLuhan establishes that the move from the oral to the literate elevated the sense of sight to a paramount place.

McLuhan makes an interesting analogy between the preliterate and postliterate cultures. According to him few forms of electronic media seemed to have reversed the sensory fragmentation of visual space. As he says, "The new media are not bridges between man and nature; they are nature." Further he says, "By surpassing writing, we have regained our Wholeness, not on a national or cultural, but cosmic plane. We have evoked a super-civilized sub-primitive man."

Referring to the electronic age that reminds of the age of orality, McLuhan states, "We are back in acoustic space. We begin again to structure the primordial feelings and emotions from which 3000 years of literacy divorced us" (208).

McLuhan's writings have provided important tools to understand contemporary oral consciousness, especially how a new medium of technology (in this case writing) possesses the power to isolate one sense (eye) over another (ear).

The age where sight dominates over ear can be nothing but discriminatory towards the blind. This assessment of McLuhan's work can help argue that the age of postliterate orality will be more accommodating for the people with vision problems. As I said earlier in the age where ear regains its lost value, we are likely to make ear as the main medium for obtaining knowledge.

In the latter part of this chapter, I will discuss the main media through which secondary orality manifests itself in our daily activities.

The End of the Gutenberg Era?

McLuhan, long before the age of ascending orality, predicted a big transformation in the perception about print. In *The Electronic Age: The Age of Implosion*, McLuhan discusses the idea that the explosion of the electronic age actually creates an implosion of our models of perception.

“Today, at the end of the Gutenberg era..., we find new fascination with all the pre-literate cultural modes of man. Many are now disposed to reject the entire achievement of literate Western man in an effort to recover integral values” (21). Presaging the forthcoming challenge to print books McLuhan further opines: “There will be no more classrooms and no schools and no subjects” (34). He is, essentially, looking to some future point where we will move away from this structure of education that is based on the technology of his era. In McLuhan’s view, the technology of that era, and everything based on print, betrayed an ocularcentric bias.

Not everyone agrees with McLuhan’s view that the age of secondary orality will be the end of the Gutenberg age. Even though electronic devices, such as audio books, depend on print and writing for their existence, McLuhan and some other scholars have declared them as harbingers of the demise of print. Walter Ong does not think in that manner. “Despite what is sometimes said, electronic devices are not eliminating printed books but are actually producing

more of them. Electronically taped interviews produce 'talked' books and articles by the thousands which would never have seen print before taping was possible.”

The same view echoes in David Bolter’s *Writing Space*. Any new format, in Bolter’s opinion, does not necessarily lead to the obliteration of the other. He demonstrates how the old and new technologies compete with each other. Rather than killing each other, they remediate each other. Bolter uses the fact that some print books are arranged like a hypertext and the elements of print page are evident in hypertext, to justify his claim about remediation of print in the electronic spaces and the other way around.

Remediation, Bolter argues, is a process of cultural competition between or among technologies. For centuries, the Greeks and Romans conceived of their technology of alphabetic writing on papyrus roll in a dialectic tension with the oral tradition that writing only partly replaced. Ancient prose, even philosophy and history, was often highly rhetorical, as if the writing were still trying to imitate and improve on oral presentation (23-24).

Explaining further the concept of ‘remediation’ Bolter presents a historical overview of this process. In about the 8th century B.C., Bolter says, the Greeks began to “refashion the space of oral mythology and heroic legend into the more precise and linear space of the papyrus roll (and stone or wooden inscription), a process that, according to Eric Havelock, lasted hundreds of years. In late antiquity the shift from papyrus roll to codex refashioned the space again, making more effective use of the two-dimensional surface to deploy text” (23).

In Western Europe, Bolter explains, the shift from handwritten codex to printed book was another such refashioning, and the shift to electronic writing is yet another. “We might call each such shift a ‘remediation,’ in the sense that a newer medium takes the place of an older one,

borrowing and reorganizing the characteristics of writing in the older medium and reforming its cultural space. Writing on papyrus remediated oral communication by involving the eye as well as the ear and so giving the words a different claim to reality. The other shifts too blatantly or subtly changed the terms on which we as readers approach the text and its mode of representing the world” (23).

Pointing towards the mutual give and take, in addition to the competition, between technologies, Bolter suggests, “Remediation involves both homage and rivalry, for the new medium imitates some features of the older medium, but also makes an implicit or explicit claim to improve on the older one” (23).

After providing a detailed historical overview of remediation in relation to various versions of books, Bolter agrees that digital technology is turning out to be one of the more traumatic remediations in the history of Western writing. One reason is that digital technology changes the ‘look and feel’ of writing and reading. A printed book could and did at first look like a manuscript, its appearance changing gradually over several decades.

Roger Chartier in his *Order of Books* argues that the current shift from print to electronic technology, which he calls a revolution, entails a change greater than the one from manuscript to print: “Our current revolution is obviously more extensive than Gutenberg’s. It modifies not only the technology for reproduction of the text, but even the materiality of the object that communicates the text to readers” (15).

Even though Chartier is ambivalent about digital revolution in the field of books, he is in favor of less rigidity in the way we think about print books. He points to the fact that print book, with its evolution, has left behind many practices that were integral to the process of reading.

Reading, in Chartier's view, is not uniquely an abstract operation of the intellect: it brings the body into play, it is inscribed in a space and a relationship with oneself or with others. This is why, Chartier believes, special attention should be paid to ways of reading that have disappeared in our contemporary world.

Suggesting that orality was still very much part of literacy in early days of print, Chartier reminds us that one of the forgotten ways of reading was reading aloud. He sees the benefits of reading aloud "in its dual function of communicating the written word to those who are unable to decipher it themselves but also of cementing the interlocking forms of sociability that are emblematic of private life in the intimacy of the family circle, in worldly conviviality, and in literary circles and spheres of scholarly sociability." A history of reading must not limit itself, Chartier argues, "to the genealogy of our own contemporary manner of reading, in silence and using only our eyes; it must also (and perhaps above all) take on the task of retracing forgotten gestures and habits that have not existed for some time" (8).

Chartier reminds his readers how much print has changed the nature of books since the birth of the Gutenberg era. In the sixteenth and seventeenth centuries, Chartier informs, the reading style implicit in a text, literary or not, was still often an oralization of the text, and the 'reader' was an implicit auditor of a read discourse. The work, which was addressed to the ear as much as to the eye, plays with forms and procedures that subject writing to demands more appropriate to oral 'performance'. Many examples of this sort of continuing link between the text and the human voice can be found. *Don Quixote* is one of the examples cited by Chartier.

Contrary to Chartier, Sven Birkerts is only concerned about the rapid changes technology and hypertext are bringing to the nature of reading and the print book. In *Gutenberg Elegies*, he expresses his frustration with the change in the amorphous expression, “MahVuhHuhPuh.”

“MahVuhHuhPuh” was the answer, Birkerts explains, when his daughter scribbled something on a piece of paper and asked him to read what she wrote. Birkerts has used this seemingly meaningless word to convey the fact that books are increasingly losing meaning for the youth of current generation. He ruminates how esteemed books used to be for him, how much pleasure he used to derive from books since his early childhood. But now— he establishes this with an example from the class he taught— students don’t want to read. Let alone complex writers like Joyce, students don’t get simple stories by Poe.

The main question for his consideration in this essay is, “What is the place of reading, and of the reading sensibility, in our culture as it has become” (13)? Bound books, according to Birkerts, are the only true carriers of culture to the coming generations. Thinking about the fiasco in his short-story class Birkerts laments, “The collective experience of these students, most of whom were born in the early 1970s, has rendered a vast part of our cultural heritage utterly alien” (19).

A sense of pathos, a sense of foreboding, a sense of frustration is palpable in the article, and it sounds like a dysphoric crescendo as he starts philosophizing, “Things have shifted; they keep shifting. We all feel a desire for connection, for meaning, but we don't seem to know what to connect with what, and we are utterly at sea about our place as individuals” (19).

I share Birkerts's concerns about the declining interest in reading in the society today. But I do not share his bias for print and his belief that only bound print pages can be true conveyors

of culture and knowledge. Bibliomaniacs like him, who blame technology for students' aversion to books, must remember that it was technology that first made these books possible. Primary orality was as capable of transferring culture as print, and I believe secondary orality will be as capable. Audio books, as I demonstrate later, can surely regenerate interest in reading and books.

Secondary Orality and Talking Books

Talking books or audio books have benefited the most due to the rediscovery of the sense of listening in this electronic age. Whereas popularity of print books has noticed a sharp decline, audio books are being bought and getting checked out much more frequently from libraries. This fact gives a sharp rebuke to the suggestion that audio books are meant for those who can't read on their own.

In this section I will maintain that the audio book is neither going to kill the book nor it is going to murder any culture; it is just changing from being merely visible to becoming audible as well. In today's media rich environment they are the need of the day. I believe that the ocularcentric bias in favor of a specific packaging— print pages bound together— needs to be challenged. We are living in the advanced age of secondary orality and the audio books are a necessity of this age. I will discuss several advantages of using audio books for learning. The main benefit, for the purpose of this dissertation, is that audio books demolish the barrier between different platforms both the print-disabled and those who can read print use for reading of books.

In the age when the concept that meaning comes from binary oppositions has been challenged and debunked, I do not think we should go in to the debate whether print is better or

audio. I have no doubt that print is still essential for our reading needs. We cannot completely do away with it, nor should we suggest such a drastic and counterproductive measure. My suggestion in this section will be that a balance should be maintained between ocularcentric and sonocentric ways of reading. I will try to demolish the line that separates the binary opposition of seen and heard by demonstrating the technological possibility that the same book is read with eyes as well as with ears separately or simultaneously.

To differentiate them from electronic books that can be read using a text-to-speech program, I define 'audio book' as the audio version of the printed books, produced either by recording the reading aloud performed by a human narrator, or by electronically converting the text of a printed book into speech. In that sense, an audio book is not really independent of the print book, but rather, just a 'supplement' to it. I, however, would like to establish that it is by no means a 'poor substitute' for the print book.

I understand the term 'supplement' in the Derridian sense: something that carries the meaning of being 'in addition to' and/or 'substitute for'. I will try to prove the utility of audio books vis-a-vis the print books in both these senses.

The debate between audio book and print book can be stretched back to the debate between orality and literacy, or between eye and the ear. This debate has been there before we had either print or audio books. In *Phaedrus* Socrates discusses the drawbacks of writing. It should however, be specified that Plato is vague and sometimes contradictory in his treatises as to which between the orality and literacy is superior. McLuhan and Havelock suggest that Plato was trying to take the place of the Sophists who were held in great esteem in the Greek society.

As we know it, he did succeed in this endeavor, hence in the western discourses we find Plato's stamp, and not that of the sophists.

Plato's victory brought a sea change in western metaphysics. It can be argued that it was as a result of this victory that seeing is generally equated with believing and hearing with mere unreliable hearsay. According to Martin Jay: "Once the battle against Sophism, which defended rhetoric and the ear, was won, Greek philosophy could elevate a visually defined notion of disinterested, monologic, epistemic truth over mere opinion or doxa, Plato extolled the virtues of reason and denigrated the emotional side of human beings." He wouldn't let any poet live in his ideal state. Walter Ong, as discussed above, has discussed extensively the direct relation between literacy and supremacy of reason in his *Orality and Literacy*.

The printing press impacted Western thought as much as literacy did earlier. According to Jay, the impact of Gutenberg's revolutionary breakthrough, so sensationally trumpeted by Marshall McLuhan and Walter Ong, seems in fact to have been far greater than the mere dissemination of previous knowledge and practices. "The new intensity of visual stress and private point of view in the first century of printing," McLuhan claims, "were united to the means of self-expression made possible by the typographic extension of man. Socially, the typographic extension of man brought in nationalism, industrialism, mass markets, and universal literacy and education. Print presented an image of repeatable precision that inspired totally new forms of extending social energies" (145). As if these effects were not enough, he adds that "perhaps the most significant of the gifts of typography to man is that of detachment and noninvolvement. ... It was precisely the power to separate thought and feeling, to be able to act without reacting that split literate man out of the tribal world of close family bonds ..." (146).

With the development of print, Ong demonstrates, Western culture moved even further away from a hearing dominated sensory world to one governed by sight. More than writing, “print suggests that words are things” (118). With the interiorization of this view writing/printing was no longer done with the intent to recycle knowledge back into the spoken world (as it was in, for example, Medieval university disputations); the purpose of writing was no longer reading it out loud. Ong also suggests that print encourages closure, a feeling of finality that was never present in, for example, oral storytelling. This sense of closure resulted in tightly knit narratives and complex plots in the novels.

These tightly knit narratives and complex plots in the novels have been enjoyed by Sven Birkerts, which, as he complains, are not read, and if read not understood by today’s generation of students. To be more precise people don’t like print books as much as they used to until late 1990s. This generation which is prone to multi-tasking, cannot afford singular attention that a print book requires. ‘Deep attention’ is a rare commodity now. It is difficult for today's students to sit for half an hour at a stretch, with the singular intent of reading a book, without getting distracted.

Katherine Hayles believes that the reason for this disinterest in books is the “media rich environment” in which today’s students have always lived. She suggests that today's generation is capable only of hyper attention. Such attention allows people to multitask without getting involved in a single task for too long. Hayles attributes this enervation of the deep attention to today's media-rich environment. Explaining how media stimulation affects brain functioning, Hayles explains, “It is well known that the brain's plasticity is an inherent biological trait; humans are born with their nervous systems ready to be reconfigured in response to their

environments. While the number of neurons in the brain remains more or less constant throughout a lifetime, the number of synapses--the connections that neurons form to communicate with other neurons--is greatest at birth” (188).

Hayles explains the impact of the environment on a growing child with a process known as synaptogenesis. A new-born infant undergoes a pruning process whereby the neural connections in the brain that are used strengthen and grow, while those that are not used get destroyed and disappear. The evolutionary advantage of this pruning process is evident, it gives humans the power to adapt to widely differing environments.

Although synaptogenesis is greatest in infancy, plasticity continues throughout childhood and adolescence, with some degree continuing even into adulthood. Hayles suggests that in contemporary developed societies, “this plasticity implies that the brain's synaptic connections are coevolving with environments in which media consumption is a dominant factor. Children growing up in media-rich environments literally have brains wired differently than humans who did not come to maturity in such conditions” (Hayles 189).

One of the corollaries of the prominence of hyper attention in today's generation is that the habit of reading has suffered a massive jolt. The writers and publishers are very often found complaining that books are not selling. The books are generally read only if they are part of the syllabus. General reading of books seems to have become a thing of past.

Ong's assessment that orality is re-emerging is based on the fact that more and more people now prefer to listen to the news rather than read it. Radio or music players are a preferred source of entertainment now, more so than books and journals. The telephone is a preferred source of communication over letters.

Since in all the examples of secondary orality which Ong uses, the listener does not do anything but listen passively, I would prefer calling secondary orality as ‘Secondary aurality.’ Ong's concept of ‘Orality’ requires that the audience actively participate in the performance. In the primary oral cultures a bard or a rhetor was supposed to perform according to the mood of the audience. The oral method Socrates used for imparting knowledge or creating awareness in his disciples required a two-way communication between the teacher and the disciples. However, these days the audience is passively receiving the audio content. Hence, it is preferable to use the term ‘aurality’ rather than ‘orality’.

We are making use of our ears more often now to access the information and entertainment. The sense of sight, which has been privileged ever since the emergence of literacy, is giving way to the sense of hearing. It seems we have entered the age of ‘Secondary Aurality.’ The ‘secondary aurality’ is distinct from the ‘primary aurality’ in the way it demands the attention of the audience. It was not possible to listen to a performance or a discourse and perform other things simultaneously in the age of ‘primary aurality.’ ‘Primary aurality’ was more engrossing than the secondary one. The ‘secondary aurality’ is more suitable for this multi-tasking age.

The audio books are the best way out for the problem of absence of reading caused by the lack of deep attention. For this hyper attentive generation, audio books offer an interesting way of reading. Multi tasking, which is one of the essential requirements of this electronic age, is not possible while reading a print book. However, along with listening to audio books, the listener/reader can perform several other tasks.

There cannot be a second opinion about the impending academic collapse of a generation that does not read. The silver lining, however, is that technology has made alternatives to the traditional books possible. One such alternative is the audio book. Now that the alternative to print books is available, there seems to be a reawakening of the interest in books. When I interviewed the manager of the Orange County Library System about the audio books, I was surprised to know that the audio books comprise less than 4 % of the entire library collection, whereas 50 % of the total checked out material is non-print material.

Pedagogically also, the audio books can play a significant role. They can create and enhance a desire for reading if they are introduced in the formative years of a child. According to Dr. Denise Marchionda, a former Assistant Professor of Education at Notre Dame College in Manchester, “Listening to audio books can successfully promote a reading habit and create a lifelong reader. Parents, teachers, librarians, or friends who are making audio books available to children and others are giving them the most precious gifts of reading, literacy, and knowledge. They are also giving them the ability to read and experience literature anywhere, anytime, anyplace.”

In *Creating Lifelong Readers through Audio books*, Dr. Marchionda has enumerated the benefits of the audio books for children. They may be summarized as under:

1. When children enter school and begin the formal process of learning to read, audio books easily can be used to supplement the curriculum and can become part of at-home leisure reading.
2. Reading a text along with listening to an audio book is one way to provide a good model of reading for a developmental reader. Audio books offer suitable models for

proper enunciation and inflection. In school, students are often asked to "read aloud" for their classmates. Some accomplished and practiced readers do so in high fashion. But not all students are equally verbose. Some children have had limited exposure to good reading models. Audio books can fill in the gap. Listening to practiced orators, while reading along with the printed text, allows students to see how punctuation is used for inflection, pause, or stops. Fluency, the ability to read with no breaks in the narrative with clear and well-timed enunciation, is also an acquired reading skill that can be honed while listening.

3. For any level reader, child to adult, audio books can help support vocabulary acquisition. Listening vocabulary is often at a higher level than a person's reading and speaking vocabulary. Children who listen to a book being read while following along with the printed text can both see and hear new words and the new words are more likely to be remembered.
4. Audio books encourage active listening and critical thinking skills--skills necessary for reading comprehension.
5. When presented with classic literature or archaic and complex structures of language, for example, Shakespeare, using an audio book as a guide can be extremely helpful to understanding and deciphering the meaning of the language when heard orally. Shakespeare's works were meant to be heard and performed! Therefore, the audio book presentation is a wonderful way to hear the proper names and uncommon words pronounced correctly. Not always easily understood when seen alone in print, antiquated words may not be spelled phonetically, creating difficulty in reading.

These eulogies of the audio books notwithstanding, academia has been more or less silent on the issue of the audio books. The only discussion on such books I could find in a scholarly treatise figures in a chapter of Sven Birkerts's *Gutenberg Elegies*. His opinion of the audio books is not particularly favorable.

Problem with Audio Books Stated by Birkerts

I would now like to discuss the concerns Birkerts has with the audio book. In the following paragraphs, I will try to respond to each of his criticisms of such books. Following are the criticisms he levels against audio books in his *Gutenberg Elegies*.

We can start with a less serious criticism which is leveled on linguistic grounds, the appropriateness of calling the material recorded in audio tapes, compact discs, DVDs, computer hard drives or iPods, books. “Their efficacy as carriers of culture has been challenged. Some consider them not as edifying as the real books” (Birkerts 144)

In a way this concern betrays an ocularcentric bias: something that is merely heard cannot be the true carrier of the culture. It is like suggesting that Homer’s epics were not edifying or good conveyors of culture before the compositions of the famous bard were committed to the paper/parchment. There are still communities which use folklores or oral media to pass on their culture to the coming generations. The focus of such criticism then is not on what the books contain, it is more about the physical form of the printed books, the written sheets of paper bound together; this is more about form than substance, more about façade than spirit.

Another of his main criticisms of such books is based on his assumption that the playback speed of the narration cannot be regulated in an audio book. “Until I listened to a book on tape, I didn’t realize how much I depend on the freedom to slow down, speed up, or stop altogether while reading. With certain writers I might pause significantly a dozen times over the course of few paragraphs... Once for comprehension, several times more to savor a phrase...” (Birkerts 146).

One of the benefits of an electronic book is the amount of control a reader has on it. As far as stopping the play is concerned, Birkerts can think of using the ‘play and pause button’ on his computer or any other player for that matter. This button is made available by all the media players. I don’t see why it won’t work. Slowing and speeding up the player has been possible for more than 20 years now. Windows Media Player, version 11 onwards provides the facility of increasing or decreasing the playback speed of the file being played on the computer. Most of the mp3 players, iPod for instance, have a mechanism for audio book by means of which the listener can adjust the playback speed of the book.

The next criticism leveled against audio books by Birkerts is based on the assumption that all the audio books are abridged versions and not complete books. “With some definite exceptions, books on cassettes have been cut, in some cases gutted. The percentage of the loss varies. With longer novels we miss up to half the novel.” Birkerts calls it a “rhetorical fallacy: to take the part in place of the whole.” Birkerts feels obliged to ask, “What is the value of a symphony from which half of the second and all of the third movements have been cut? To what extent is the listener entitled to claim the experience of a work?” (148).

It seems like a genuine concern until we find out that most of the audio book producers now make both the complete and the abridged version of the books available to the customers. In the current scenario the books which have only abridged version in the audio format are exceptions. The target users of the audio books produced earlier were the people regularly on the move. The passages that required an intense concentration were not included in the audio books as they don't jell with multi-task environment. A dearth of good committed narrators and lack of demand of audio books in the initial stages of the audio book market compelled producers to go for abridged versions. As the industry is burgeoning, with demand for such books going up, more and more people are getting trained to become readers/narrators. The abridged versions are still useful for less serious readers or for those who can't give much time to books. However, as the text-to-speech engines advance more, it will be more possible to produce an audio book version for a specific part of the book or the entire book, depending on the specific reader's interest.

His next problem with the audio books is based on the gender of the narrator. Birkerts believes that if the writer and the narrator don't have the same gender, reading does not make a very good impact. "When I read a male writer, I simply adjust my vocalization to the tone of the text. When I read a woman, I don't attempt an impersonation. But I am aware that my voicing is a form of translation. But when I listened to a cassette of John Cheever's stories read by an expressive female voice, I just couldn't take it. Midway through the enormous radio I had to pop the tape from the machine to keep her from wreaking havoc on my sense of Cheever..." (147).

I wonder how Birkerts reconciles with the printed book when a male writer writes a first person narrative about a woman. One can't be too rigid about the gender in the context of a book.

Even Shakespeare's plays during their original performances had to reconcile with such an issue. The parts of the women characters had to be played by male actors. The author himself swaps gender even during a particular literary work.

The ideal situation would be if the audio book producers ensure that the words written by the author as a male character are read by a male narrator and visa versa. We don't expect a female playback singer singing for a male actor, unless, of course, a comic effect is intended. We can hope for a future when the writer will also be the narrator in the case of audio books. But not everyone good with pen is also good with throat. Even though there are books recorded in the voice of the author, if they are compared with a version of the same book narrated by a professional narrator, the impact generally is not as good.

But synthetic speech can always be used. Now that the text-to-speech engines are so advanced that they can produce a voice very close to the natural human sound, it will be just a few years before it will not be possible to differentiate between the natural and synthetic voice. Then it will be possible to produce an audio book with whatever kind of narrator the reader likes. The latest version of Amazon's book reader, Kindle 2, has a built in text to speech engine, which means that you can listen to the book being read while you yourself are reading it as well. Kindle 2 is the best example of orality and literacy coming together. The advantage of synthetic voice is that it can be manipulated by the reader. It ensures that no narrator forces his interpretation on the reader.

With the latest advances in the audio technology, one can navigate quite easily within the audio book. There are commands to jump to various levels, such as chapters, headings etc. One command will take you to the desired page number. In addition, you can highlight, underline and

bookmark passages in the book. To top it off, all these options are also available with some software that can be installed on to the compatible cell phones. It's no more necessary to carry heavy books with you to read while you are traveling. If you were already using audio books, no need to carry a heavy suitcase full of CDs. With the advanced storage devices, such as micro SD cards, you can carry hundreds of books and listen to them without having to sacrifice the other activities.

With such immense possibilities with the audio books, it is high time that audio books are promoted in schools. The pedagogues must do away with their irrational love of the print books and their illogical fear of the audio books. People with print-disabilities have been using them for many years, and they have made remarkable progress in various walks of life, despite near insurmountable challenges. The statistics shown on the Audio book Publishers Association website reiterate my claim that as far as the popular books are concerned, audio books have already made significant inroads, it is time that they are also encouraged for academic purposes.

Hypertext and Secondary Orality

Hypertext fits in to the definition of the all encompassing book of nature that Bolter discusses in his *Writing Space*. However, I will first discuss the accessibility of hypertext version of a given printed book. Unlike a traditional audio book, the hypertext based book can be read with ears as well as eyes. The example of Kindle, discussed earlier, shows the possibility of accessibility of hypertext without installing any additional software on a device.

David Bolter describes a vibrant debate taking between the apologists for hypertext and the apologists for print. They both continue to search for the appropriate rhetoric to keep us on their side. Each group claims that their writing space is more natural or truer to experience, which is a version, Bolter suggests, of the claims of immediacy that we find are also made for and against digital visual media (42).

Some of the enthusiasts for hypertext, or information technology in general, also make the economic argument that new media means new prosperity for our society. The supporters of hypertext may even argue that hypertext reflects the nature of the human mind itself--that because we think associatively, not linearly, hypertext allows us to write as we think.

Bolter cites from Vannevar Bush, who in his article "As We May Think" justifies the memex, an earlier platform for hypertext. Bush wrote, "The human mind ... operates by association. With one item in its grasp, it snaps instantly to the next that is suggested by the association of thoughts, in accordance with some intricate web of trails carried by the cells of the brain" (Bush 33).

Ted Nelson also seemed to suggest that hypertext is natural to the mind. For example, he remarked, "The structure of ideas is never sequential; and indeed, our thought processes are not very sequential either. True, only a few thoughts at a time pass across the central screen of the mind; but as you consider a thing, your thoughts crisscross it constantly, reviewing first one connection, then another" (1-16).

The supporters of print in this debate, such as Birkerts, mainly in *Gutenberg Elegies*, and Mark Slouka, in *War of the Worlds*, argue for the naturalness of print in a number of ways. Sometimes they claim that the linearity of print captures the true nature of historical,

philosophical, or scientific argument or that novels need to be linear. Sometimes they appeal to the apparent simplicity of print and the printed book. "Printed books are portrayed as closer to nature, because one can read them out of doors or in places where it is hard to operate computers. The supporters of print associate the computer with high technology, which is by definition distanced from nature or the human. They challenge the hypertextual definition of interactivity: letting the reader choose links only gives the illusion of control, which is really withheld from the reader. If authors prescribe links, they deny the reader the choice of making her own associations, so that a printed novel or essay actually gives the reader greater freedom to interact with the ideas presented" (Bolter 43).

Neither side has been moved, Bolter informs, by the arguments of the other in this debate over whether hypertextual writing is fundamentally different from and better than writing for print. Bolter recasts the debate in terms of remediation, as discussed earlier. He demonstrates how electronic writing in general and hypertext in particular can be both old and new. The process of remediation must acknowledge both their connection with and their difference from print (46).

Electronic writing is new, in Bolter's view, in precisely the same sense that each medium is new at its introduction. "Each new medium claims to provide a new strategy--in this case the strategy involves interactivity and the unification of text and graphics--for achieving an authentic experience for its reader. Hypertexts such as the World Wide Web refashion the voice of the text as we have known it in print and in earlier technologies of writing; they turn vocal writing into spatial writing" (45). Bolter argues that the excitement and immediacy of the text is no longer an aural experience, as it was when texts were in manuscripts and later in printed format. The World

Wide Web, instead, offers us the experience of moving through a visual and conceptual space different from the space of the book. Although this experience still depends on our intuitive understanding of that earlier writing space. Indeed, Bolter says, “we depend in a variety of ways on our knowledge of print in order to read and write hypertexts” (46).

On the other hand, the novelty of electronic hypertext reflects in that it uses the printed book as its object of remediation. In Bolter’s view, “We evaluate hypertext over against hundreds of years of experience with print. The very fact that electronic writing must confront the tradition of print makes electronic writing different from print ... The World Wide Web now plays roles that only a few years ago were assigned almost exclusively to print, yet we do not experience the Web as a printed book” (46). Referring to the similar debate in the 15th century, Bolter reminds that the printed book depended for its self- definition and its strategy of remediation on the handwritten codex. The debate over those two media was, however, less vehement than the current debate over electronic writing. Just like hypertext, the printed book was both new and old in its work of refashioning. New media, as Bolter argues, are always new in their redeployment and refashioning of their predecessors.

Bolter sums up the debate by adding that in this late age of print, print and electronic writing still need each other. Print forms the tradition on which electronic writing depends, electronic writing is that which goes beyond print. Print now depends on the electronic too, in the sense that printed materials find it necessary to compete against digital technologies in order to hold their readers. “For this reason print is becoming hypermediated, as it incorporates verbal genres and gestures in self-conscious imitation of and rivalry with electronic media, especially the World Wide Web” (46). Bolter concludes his commentary on the debate between print and

electronic writing by stating, electronic hypertext is not the end of print; it is instead the remediation of print. (47).

The Talking Hypertext

Realizing the need for orality, and sensing its popularity, many web based services have included speech with the hypertext. Popular scholarly database, JSTOR, allows users to download an mp3 version of all the articles available in their database. Playing the mp3 version of the article is like listening to the article read by someone else, even though the sound reading the article is synthetic.

Similar to the way JSTOR's talking scholarly articles benefit students and many academic professionals, many journalists and business professionals extol the benefits of a service called Speakwire, the speaking newswire service of CEC systems introduced a few years back to bring news to computer desktops from around the world. The talking newswire service gathers news feeds from the prominent news organizations around the world and delivers it to computers as a speaking summary of events from news, politics, business, sport, fashion and so on.

According to various press releases, this service is getting popular and being availed by more people around the world. Gordon Renton of Speakwire said in an interview, "As more people get to hear the results of speech technology we are beginning to find the barriers breaking down to this method of delivery." Explaining the barriers he says, "Most people associate computer speech with visually impaired users. I think that is missing the point and we set out to

demonstrate just how universal speech is. It's the nearest equivalent to a common currency and can be exchanged and understood as easily.”

Glorifying orality he further outlines the speech based services his company has been involved with. “Way back in 2003 when we first released PanaVox our method of internet speech technology delivery, it had grown steadily until we released Speegle and then it really began to takeoff. In an instant people got the point. We had improved speech quality to thank for the exponential growth of our service and at times it was difficult to keep up with traffic demand. With new investment we have overcome most of the short delays and can now keep pace with the growth of this new service in the coming months.”

Arguing in favor of this service, Renton adds, “It is a functional tool which will save time for those professional people who need to keep up with world events as they happen. Speech is compelling, speech is instructive, speech is the most direct form of human communication. Speakwire brings these elements together in a news service which can be used by everyone. It includes you.” Renton, while extolling the virtues of this service, helps glorifies secondary orality.

Another speech-based service to read aloud hypertext for people all kind of abilities is Speegle. Speegle is a search engine that reads aloud the search results using the built in text-to-speech on the website. One can assume that Speegle is a combination of speech and google.

In the article “Text to voice technologies” available on the speegle home page, the designers of the service list the benefits of text-to-speech technology. “Text to voice or text to speech technologies have many useful applications, from helping people with certain disabilities to communicate easily or making your life easier while working or studying.”

Providing a historical background of this technology the article says, “Computer software that transforms written text into speech has evolved immensely over the last two decades. However, early use of text to voice technologies and trying to automatically transform written texts into speech dates back to the 1940's - 1950's. Scientists invented electronic speech analyzers able to reproduce, in speech, the words typed on a keyboard. In the 1980s and 1990s the technology developed substantially. MITalk systems were the leaders in the development and their work was based on the work of MIT scientist Dennis Klatt and the Bell Labs Systems.”

The text-to-speech technology for a long time remained difficult to use for regular purposes. The speech sounded robotic and often did not make sense to average users. Yet, it improved in recent days.

Once computers started to be a familiar presence in our lives, different types of software capable of turning a written text document into speech became available. Text-to-speech technologies have now the capacity to render an almost human voice.

This technology is now mainstream, yet it helps people with disabilities, and they don't have to be print-disabled. People dealing with speech impediments benefit now from a simple, effective and cheap technology, allowing them to communicate properly. The person who made text to voice technologies most famous, the Speegle website reminds us, is the genius physicist Stephen Hawking. Text to voice technology made it possible for Stephen Hawking, who is a paraplegic, to communicate orally with other people. But, of course, he is just one of the tens of thousands of people all over the world who use this type of technology to drastically improve the quality of their life. Text to speech software made it possible for people with severe speech impediments to overcome their disabilities and to become more productive.

Pointing towards the universal appeal of this technology the author says, “Helping those with disabilities is not the only application of this type of technology. To be able to turn a text into voice might come in handy in many situations. We may have many e-books available now, but people don’t have time to read them. As a solution the author suggests, “we do have a lot of boring chores to do each day: driving to work and back home, going shopping, cleaning the house and so on.” Indeed, with text-to-speech technologies, one can transform any e-books into audio books, put them on a small device (MP3 player, smartphone and so on) and enjoy them any time you want. Some conference organizers have also been known to transcribe the conference speaking notes in to e-book format and that in turn can be listened too anywhere using text to voice technologies.”

Students can also benefit greatly from using text to voice software. All those long textbooks can take a lot of time and energy to be read. Instead of spending many hours reading them, they can transform them into speech and listen to them while exercising or walking through the campus. Concluding the positive description of text-to-speech technology the author says, “People have different ways of learning. For certain people, visual memory works best, which means they will learn faster if they see the actual printed text. Well, that’s not a problem: any book, magazine or article is available as written text. But there are also people who find it more difficult learning and remembering written texts. They have what is called an ‘auditive memory.’ This means they learn new things much easier by listening, as opposed to reading. If you are one of these people, text to speech technologies will be a great way of learning and consuming books and information.”

Anet Dekker, in a news article 'Language in Art,' presents us with another scenario by describing a project that uses the fairly new text to speech conversion technology with further innovation. Graham Harwood and Matthew Fuller designed TextFM in 2001 to orally intervene during radio broadcasts, seminars, in clubs etc. Harwood and Fuller took advantage of the widespread availability of mobile phones to allow people to broadcast voice messages over the public radio airwaves. Instead of using the voice they made use of the popular texting methods. The user can send a normal text message to a central phone number, where a computer captures it. The computer converts the message to speech using text-to-speech software and the spoken text is then sent to a transmitter and broadcaster over a FM radio frequency. The user can also include several optional codes specifying the language the message must be in, which of the ten voices to use, the pitch of the voice, and the speed at which the text must be read. Their first interest in this project came from looking at hidden possibilities that exist in different media technologies, after mobilizing these they mixed them with others. The project is also about finding out what potential cultures of communication exist in the public space.

Universal Access to Ubiquitous Technologies

Ubiquitous devices, such as cell phones and PDAs, have the potential to make information universally accessible. Universally accessible in this sense not only means to everyone, the sense in which I have been using the term in this dissertation; it also means at all times. These devices are always on, and can remain connected to the World Wide Web all the

time. With a possibility of large storage, these devices can store thousands of books and plenty of other reading material.

I will briefly talk about iPhone and other smart phones which allow people with print-disabilities to check emails, browse the internet, send and receive text messages, and virtually everything else that they allow anyone else to do. For blind people they may be of more use than others. There are applications that can read currency. The US dollar is the most inaccessible currency in the world. In other countries blind people can tell one bill from the other by measuring their sizes. US dollar, however, is uniform across denominations. The application that identifies the currency and speaks out the denomination is a big enabler of universal access.

There are applications that connect directly to human beings. So, for instance, if a blind person wants to read a billboard, all he needs to do is take a picture of the billboard and upload it on the application. The image reaches to a volunteer who decodes the picture and texts with the relevant information. In this ablist world a lot of valuable information is provided in inaccessible format. Such applications help in making that information accessible.

Mobility is a big problem for a many blind individuals. Smart phones and other ubiquitous devices come with GPS systems that guide people from one place to another. These GPS applications can also tell the user where they are located, in the event they are not sure about their location. When they are out and about the neighborhood, they can turn on the 'walk' guidance feature and can get help from the GPS application.

All these and many similar benefits are possible if the ubiquitous device has a talking software installed. If the user has to buy a special screen reading application to read the screen aloud, it defeats the purpose of universal access. With the exception of iPhone and Android

based phones, one has to purchase an assistive software. Talks, the most advanced and most popular of these, costs \$300. Screen readers are free for Android based and Apple devices. However, it's Apple-based devices that have the screen reading application already installed. The text-to-speech voice on iPhone and iPod Touch not only helps the blind, it is a big favorite among other iPhone users as well. They use it for reading books aloud and to interact with the Siri Assistant, the application I discussed in relation to the age of talking computers.

There is another dimension to universal access in relation to books. The blogosphere is full of complaints about electronic books bought for a specific platform not being accessible on the other platforms. It is not a disability related issue in the traditional sense. Yet, it equally impacts print-disabled users.

People want to be able to read their books on all the platforms, no matter what platforms they bought it for. If I buy a book to read on my computer and cannot read it on my iPhone, it is an accessibility issue that can be avoided. In the next section I will discuss Digitally Accessible Information System (DAISY), the format that is used by the publishers of electronic books for the blind. The DAISY format can be accessed on computers as well as phones, provided both have software to read a DAISY book. Interestingly, epub, the cell phone format for books is almost the same as Daisy. Daisy consortium, the brain behind Daisy, also contributed to the epub format. Still, people hardly know about Daisy, and epub format is very popular among those who read books on their cell phones. Daisy books, even though primarily conceived of to help people with print-disabilities, can be enjoyed by everyone. I will compare Daisy with National Instructional Materials Accessibility Standard (NIMAS), the system installed by the government to make electronic accessible to the blind students.

Digitally Accessible Information System

To exploit the possibilities offered by electronic books for the people with print disabilities, and to set the standards for accessible text books (the general electronic books still don't have a common standard), the US Department of Education started to work towards a new initiative. It was later known as National Instructional Materials Accessibility Standard (NIMAS). In December 2004 the educators and disability activists were able to have NIMAS included as a mandate for states and publishers in the Individuals with Disabilities Education Improvement Act (IDEA 2004), an achievement that made NIMAS specification from voluntary to required. "The NIMAS provisions in IDEA 2004 require state and local education agencies, SEAs and LEAs, to create both a purchasing methodology and a distribution plan for acquiring accessible, alternate-format, student-ready versions of core instructional materials (textbooks) from publishers by December 2006" (Meyer and Rose 94). To facilitate this process, the U.S. Department of Education has established the National Instructional Materials Access Center (NIMAC) as a repository for NIMAS source files provided by publishers. These files will be made available to organizations that are authorized to convert those source files in to accessible text books. Meyer and Rose claim that NIMAS "marks a major step toward ensuring that the ubiquitous school textbook will be within reach of students with disabilities at the critical point of instruction in an accessible and usable form" (95).

NIMAS approach may be worth trying, but the problem is that it is geared only towards students with recognized disabilities. Moreover, there is still no standard that does justice to the reading needs of all kind of disabilities. A blind person faces different kind of problem while reading, in comparison to someone with locomotor disabilities. As I suggested earlier that the

concept of ability/disability as a static construct need to change. People may not have any physical, visual or mental disability, yet a lot of students have reading or comprehension disabilities. So in place of publishers providing pdf or xml files as source files for the textbooks, they can provide a DAISY version of books for all the students who may not like print textbooks. DAISY books can be read on computer screens if the student so prefers. They can also use the audio format if they understand audio better, or if a situation does not allow use of text.

The problem with audio only books that are used as an alternative for the blind students is that they take a lot of time producing. Moreover the reader cannot control the speed of the narrator's voice. Traditional audio books are as linear as it gets. You have to read them from beginning to end. One can fast forward to reach a desired portion of the book, but it is not an efficient way of perusing a text book. When a student reads books to consult for a paper or while preparing for exams, he/she has to jump back and forth from page to page. If your teacher tells to read from page 150 to 170, for instance, there is no way to know when you reached page 150 in the case of traditional audio books. Such books are not liked by the students whose life almost depends on them, for people with reading disabilities, who otherwise have access to print books, such books will appeal even less.

But DAISY based audio books are not a problem at all. If they are created with appropriate specifications, readers can access the entire book from the table of contents itself. The main section of DAISY book presents the sections and subsections in a tree view. You can use a go to page command to reach any desired page. They are more flexible than traditional print books as well. You can create book marks, for example, to return to important portions of the book.

If a student is unable to understand synthetic speech included in text to speech software, they can still use the audio books read by human beings. DAISY books allow simultaneous existence of text and audio in the same file. This approach makes it possible for a reader to jump from one section to another, search text or check spellings of an unknown word even while using an audio book. Such books can be very useful for people with language difficulties or while learning a new language even for people with any kind of disability.

Reading such books on computer gives some added advantages. When writing a paper or assignment, they can copy from the book and paste in the document when quoting from the book. When looking for references they can immediately check for references on online encyclopedias or other relevant websites. If their computer has a dictionary program, they can check the definitions when they encounter an unknown word. They can do all this with any e-book but they can't use audio with the text on those books. They can't even transfer traditional electronic books to other devices like cell phones. This is the main benefit of DAISY books that true to the principles of universal access they recognize diverse needs and they offer flexibility of platform to the learners.

Since DAISY books are a combination of several files, they can serve multiple purposes and they can work on multiple devices. Xml file is the main part of DAISY books. Xml with a source css file makes it possible to access those books on multiple platforms. Braille based PDAs and Braille Note takers are just another platform on which these books can be played.

Braille based PDAs and Note takers have built in text to speech reader which reads the text aloud. For those who prefer to read in Braille, these devices have built in "Braille display." A 'display' for the blind sounds like a contradiction of terms, however, it is a Braille display as it

displays information in Braille in tactile format. Often deaf-blind students have no other choice for reading but to read in Braille. To be able to read in Braille thus should be an essential condition for any accessible format of the book. As I have argued in this paper, DAISY books allow precisely that.

DAISY books when read on these Braille based devices offer the same kind of benefits and flexibility as discussed earlier. The benefit discussed earlier of reading a book on computer also applies to these Braille based devices. These devices can connect to internet. They mostly have a built in dictionary and they can allow composing of documents, copying and pasting from one document to another. The books available online often use JAVA or Flash based construction; they don't work on these Braille devices.

Meyers and Rose in "Transforming the Textbook to Improve Learning" have the following to say about the traditional Braille books: "For much of the past century, the process of creating Braille has been one of retrofitting existing print works into embossed versions. Of necessity, this has involved obtaining, storing, and transcribing the print versions, re-creating the work in an embossed format, validating and proofing the embossed version, and mailing these versions to the Braille readers who have requested them. In addition to the complexity and time required to complete this process, the ratio of embossed Braille pages to pages of print is approximately 6 to 1: a 500-page print book would require nearly 3,000 pages of embossed Braille" (107).

Since these books can be read on these devices, the universities, Federal, state and local governments will save billions of dollars spent on making print text books available in Braille. Since college textbooks have a new edition every two to three years, spending so much of effort

and resources on something that will become redundant that soon does not make any economic sense. In today's hard economic times, spending that much becomes less desirable. With DAISY books, such waste can be avoided. It makes so much environmental sense too. Being able to read textbooks on Braille devices will obviate the need for cutting of millions of trees every year to provide textbooks in traditional Braille. In other words, DAISY books disrupt several binaries by being applicable to that many platforms. Some of these binaries are: print/Braille, print/oral, print/electronic, desktop/mobile.

Last Words

It is appropriate to conclude this dissertation on this note of inclusivism. Throughout this dissertation I tried to speak for an inclusivist paradigm. Following Derrida's technique of deconstruction I made sure to avoid the trap of binary oppositions. I also remained careful to avoid the logic of supplementarity. As a result I managed to avoid saying X is better than Y, or the other way around.

I started this project with the premise that technology, being a true leveler, can eliminate differences between print-disabled and sight dependent individuals. Practically, though, the print-disabled have to access technology differently from others. There seems to be a segregated technology zone labeled as 'assistive technology.' My objective in this dissertation was to deconstruct that zone to hasten an end to that segregation.

Derrida's concept of 'metaphysics of presence' and Foucault's concept of 'biopower' helped me realize that there is nothing inherent in the disabled, or their technology, that merits

their relegation to a segregated zone. The distinction between ‘disabled’ and ‘able-bodied’ are linguistically and socially created. Otherwise, all technology is ‘assistive’ technology. Just to cite some examples: A car is an assistive device, GPS system in the car is assistive, cell phone is assistive. One who has lost them in the past knows the sense of disability.

The realization that technology, by definition, is assistive; and the realization that some electronic devices are as integral to our life as any part of our body is, made me rethink the idea of body and disability from a fresh perspective. I borrowed from the ideas of ‘embodiment’ and posthuman identity of human being as a cyborg to conceive of a post-disabled world. It is the ‘abnormal’ body that results in one’s disability, conception of beings without body is the starting point for a post-disability world. The fact that most of us live in the cyber world as decorporealized beings, prevented this formulation from being farfetched.

Having conceived of a desegregated existence for the disabled in the post-disability world, the next task I had was to find ways to desegregate technology. Like disabled people the conception of their technology is also associated with reduced functionality. I started deconstruction of the concept of assistive technology for the print-disabled by looking in to the history of their reading. Reading and writing are integral to technology: The Greek root word for technology means writing. And, reading is essential requirement for using the technology. Therefore, proposing a common technology for people with all kind of abilities essentially required finding a common platform for reading and writing. The popularity of audio books and speech technology on the latest electronic devices helped me find that common platform. In the process of arguing for secondary orality I discussed multiple viewpoints about the way we do or should read. Nowhere in the dissertation have I tried to suggest elimination of a culture, method

or a tool; all I argued for was elimination of discriminatory practices in social and technological spaces. Therefore, discussion on DAISY, the reading format that allows for multiple ways of reading on the same platform and across the platforms, was the best possible closing for this dissertation.

One of the reasons the proponents of y--based orality list in support of it is the naturalness of speech. It brings us back to the controversial, yet productive, turf of logocentrism. Murray Krieger in a related context says, "This desire to see the world in the word is what, after Derrida, we have come to term the logocentric desire. It is this naive desire that leads us to prefer the immediacy of the picture (or speech) to the mediation of the code in our search for a tangible, 'real' referent that would render the sign transparent" (Krieger 11).

One can borrow from Bolter to comment on this observation. If we connect this desire for orality with Derrida's logocentrism, then we could say after *Of Grammatology* that the desire comes into existence with the invention of writing itself. "For Derrida, as soon as culture invents an arbitrary sign system, there arises a yearning to close the gap between the sign and the signified." Bolter adds further that this yearning can take different forms depending on the available technologies of representation. "In Plato's Greece, when oratory and drama were the defining arts, the spoken word was treated as the natural sign. In one sense Plato himself created the dialogue form in order to bring his writing closer to the natural sign. Printed literature since the Renaissance has faced a different and more difficult situation, because the techniques of representation to which print has been responding have been visual rather than oral" (Bolter 57-58).

In other words, what is natural is contingent on the perception and preferred systems of representation of a given time. Print marginalized the spoken word, which is being revived in this electronic age. Besides, as I commented before, this orality in its electronic avatar is not independent of writing. It disrupts the binary of orality and literacy, and does not allow either logocentrism or ocularcentrism to become dominant. This orality, I believe, will suit Plato as well as Homer.

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