Perceptions of access to the internet for the blind: Psycho-social impacts

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Abstract

Presented through the lens of the Theory of Relative Deprivation (Tajfel & Turner, 1986), this thesis aims to establish and quantify the link between inaccessibility in online contexts for people with low-vision or blindness, and the psychosocial impacts that may be associated with this inaccessibility. As there is existing research on this topic with elderly participants (Lagacé, Charmarkeh, Zaky, & Firzly, 2016), the focus for this research was working-aged people. The following research questions were addressed: 1) Does perceived lack of internet accessibility lead to perceptions of unfairness among low-vision or blind individuals?

2) In turn, do perceptions of unfairness negatively impact their level of self-esteem, and civic engagement? The hypothesized results were modeled as lower levels of perceived access lead to lower levels of perceived fairness, which in turn, lower the levels of civic engagement and self-esteem. Using a sample of 69 participants between the ages of 21-65, a self-report questionnaire was administered. It was found that perceived fairness was correlated on three of four scale items with self-esteem levels; the perception of fairness was not correlated with civic engagement; civic engagement and self-esteem were significantly correlated; and perceived access was correlated with levels of self-esteem.

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Chapter 1:Introduction

In spite of the best intentions of the majority of people in our society, inaccessibility remains a rampant issue for those who have functional impairments (Ellcessor, 2010). Institutional discriminatory systems may result from intentional discrimination or oversight in planning. A survey conducted in South America showed that accessibility was a low priority when planning web development projects. In fact, accessibility was only considered at all in 19.9% of the projects on which the survey participants were working (Freire, Russo, & Fortes, 2008). This indicates that the problem with low levels of accessibility is not necessarily a simple matter of choosing not to incorporate accessibility into the initial planning stages, but that it is not even an issue that occurs to many planners.

Regardless of intentions, however, there are very real human impacts that can result from these existing and ongoing discriminatory systems. Understanding the human side of the story is crucial to avoiding such problems going forward. Accessibility is a key issue that is not always discussed during the planning or implementing of various online content projects. From failing to plan for snow accumulation when designing physically- accessible ramps (Lemaire, O'Neill, Desrosiers, & Robertson, 2010) to having rail cars that are inaccessible for those in wheelchairs (Council of Canadians with Disabilities v. VIA Rail Canada Inc., 2007), inaccessibility can drastically affect the lives of citizens in need of these accommodations. These inaccessible spaces can have a severe impact on the well-being of those requiring these accommodations. Research examining the impact of social exclusion and access to mobility suggests that there is a strong correlation between a lack of access to adequate mobility and a lack of access to opportunities, social networks, goods, and services (Kenyon, Lyons, & Rafferty, 2002).

While physical accessibility is very important, the ability to access online content is becoming more of a necessity and, as such, it is in need of greater awareness. In recent years, the ability to access online content has, for most of us, become much more of a necessity to function in many aspects of our lives. A number of services that were once only available by phone, paper format, or in-person are now regularly accessed through the internet. Essential services and informative resources such as education, government, and even many health care information services are now accessed online by many Canadians (Middleton, Veenhof, & Leith, 2010). In many rural areas, the online methods of access to services like these are essential to many members of the community, as services are increasingly centralized in more urban areas (Hodge, Carson, Carson, Newman, & Garretta, 2016). For example, those living in rural areas are more likely to have the need to travel father to receive health care services, and therefore visit health care providers less frequently than do their urban counterparts. As a result, people who live in rural areas typically have poorer health statuses than those in urban areas. Given the increase in online access to health services, access to the internet is a possible mitigating factor for those unable to travel to see a health care professional (Hale, Cotten, Drentea, & Goldner, 2010). This is a concern that is also directly applicable to those with disabilities, and specifically those with visual impairments or blindness, as travel is often more difficult for them than for able-bodied people (Marston & Church, 2005).

By expanding into online forums, services, businesses, and content producers are more readily available through the internet for many people who might not have otherwise had easy access to things like education, healthcare, or virtual services provided by banks and governments (Canadian Radio-television and

Telecommunications Commission, 2016). However, this means that for those who are not able to access these services online, they can be subjected to less easily-accessible methods of retrieving information and accessing services. They can also have more limited resources at their disposal and have fewer options than those with online access to the same resources (Hale, Cotten, Drentea, & Goldner, 2010).

This issue of lower levels of access can be see in an example from June of 2007. Access to information from the Statistics Canada website posed a problem for members of the public who had functional impairments requiring screen reader technologies, due to the fact that the actual statistics on the site were only available in an inaccessible PDF format. When the information number that was provided on the website to gain access the statistics in an accessible alternative format was called, the phone number dialed was unavailable. This meant that while the Statistics Canada information was available for any Canadians without accessibility barriers via the internet, those who needed assistive technologies to access them were not provided with a functional method for accessing the same content (Jodhan v. Canada (Attorney General), 2010).

Access to online media is not merely an issue of convenience. Given the extent to which online media is relied upon my most members of Canadian society in their everyday lives from work, to education, to leisure, online access is a modern requirement to function easily in our society. As of 2012, 83% of Canadian households used the internet at home (Statistics Canada, 2013) and this importance of internet to the daily lives of Canadians is something that has been recognized by the Canadian government, with the scalable broadband networks being declared essential by the Canadian Radio-television and Telecommunications Commission (CRTC) in 2016 (Canadian Radio-

television and Telecommunications Commission, 2016).

In terms of the issue of access to the internet, even without the CRTC decision regarding the internet's necessity, access to internet content could be considered to be covered as a conduit for services and goods under the Canadian Human Rights Act. The Canadian Human Rights Act, which was established in 1977 in order to ensure that Canadians would be protected from discrimination based on a variety of factors, states that:

> It is a discriminatory practice in the provision of goods, services, facilities or accommodation customarily available to the general public
>
> (a) to deny, or to deny access to, any such good, service, facility or accommodation to any individual, or
>
> (b) to differentiate adversely in relation to any individual, on a prohibited ground of discrimination. (Government of Canada, 2014)

The Canadian Human Rights Act applies this protection from discrimination to a number of marginalized groups including race, national or ethnic origin, colour, religion, age, sex, sexual orientation, marital status, family status, disability and conviction for an offence for which a pardon has been granted or in respect of which a record suspension has been ordered (Government of Canada, 2014). It has historically been upheld in connection with issues of physical accessibility, such as the case of the National Capital Commission v. Brown wherein public steps in Ottawa were not accompanied by an easily accessible alternative for those unable to use the steps (National Capital Commission v. Brown, 2008 FC 733 (CanLII), 2008). More recently it has been used to enforce accessibility in the online world as well (Jodhan v. Canada (Attorney General), 2010).

Along with having laws to protect accessibility at the federal level, individual Canadian provinces have also been eager to establish laws protecting the rights of those

with disabilities in terms of accessibility, with some even creating laws that specifically single-out online accessibility as a requirement. Ontario is a good example, creating the Accessibility for Ontarians with Disabilities Act (AODA), which not only created the requirement for accessibility both in physical and digital contexts, but goes further into detail in describing what exactly is required in terms of creating that accessible environment and the roles of business, government, and individuals when it comes to fostering accessibility in the province. The accessibility standards that exists within the context of the AODA must:

> (a) set out measures, policies, practices or other requirements for the identification and removal of barriers with respect to goods, services, facilities, accommodation, employment, buildings, structures, premises or such other things as may be prescribed, and for the prevention of the erection of such barriers; and
>
> (b) require the persons or organizations named or described in the standard to implement those measures, policies, practices or other requirements within the time periods specified in the standard. (Government of Ontario, 2016)

Additionally, other Canadian provinces have begun creating programs or legislation that include reference to the importance of accessibility and its necessity in terms of creating an inclusive society. In 2014, British Columbia launched a ten-year action plan called Accessibility 2024. This plan includes specific goals and commitments that that emerged from a disability consultation process, including specifics for online accessibility such as upgrading the government website to meet international web accessibility standards (Accessibility 2024, 2016). Nova Scotia also committed to introducing accessibility legislation in 2016, included communications, and technology accessibility in its recommendations following an Advisory Panel on Accessibility Legislation (Province of Nova Scotia, 2015). It is clear, then, that governments at both

the provincial and federal levels in Canada agree that providing access to online content is not only important, but a legal requirement for providers of digital media and public services.

While these laws exist to help those with disabilities thrive in a society dominated by those who do not necessarily need to think about such barriers, often they are not enforced or applied thoroughly in practice (Jodhan v. Canada (Attorney General), 2010) (Linder, Fontaine-Rainen, & Behling, 2015). While it is unlikely that the issues of enforcing online accessibility policies are being ignored purposely or out of malice, organizations sometimes have miscommunication regarding who is responsible for creating this online accessibility. Staff could be unsure of how to create and maintain accessibility, and sometimes understaffing is a contributing factor to accessible online services being a lower priority for a given organization (Linder, Fontaine-Rainen, & Behling, 2015). Whatever the reason for continued barriers to access, this inaccessibility in terms of retrieving basic online content creates an everyday frustration for people unable to access online content and can have a severe detrimental effect on their well-being in terms of employment (Lindsay, 2005) and education (Linder, Fontaine-Rainen, & Behling, 2015).

There has certainly been considerable research over recent years on the subject of online accessibility. However, the issue of access to online content has mostly been researched with a focus on the policies and levels of objective access (Vicente & López, 2010) (Ellcessor, 2010), as well as on the reasons for the disparity in access itself in terms of socio-economic differences in personal and global wealth distribution (Khan, Miankhel, & Nawaz, 2012). In other words, the psychosocial factors that come into play

in terms internet inaccessibility have seldom been explored. The few studies that have done so have focussed mainly on the psychosocial impacts that inaccessibility has on seniors (Rosedale, 2015). In the research of Lagacé et al. (2015) increased feelings of loneliness and reduced social capital were shown to be results of lower levels of access for the aged, showing that the lower levels of accessibility do have a negative impact. Given this impact shown in elderly populations, it is important to understand the psychosocial impact within the working-aged population as well. This younger population require access to online content to meet their peers in terms of efficiency at work (Jodhan v. Canada (Attorney General), 2010).

In terms of those who are working age, research on perceptions of access in relation to their personal feelings regarding their overall well-being has not been easily found by this researcher in the literature. It is important, then, to research the impacts on this subset of the population, as members of the general public are likely to depend on the use of the internet and digital literacy in their work lives (Coffin, Murray & Perez, 2014) and have been shown to be at a greater advantage in terms of seeking employment compared to those without accessible internet (Lindsay, 2005). This thesis work intends to fill a gap by conducting research on the working population and the psychosocial impact of internet inaccessibility.

Theoretical Overview and Research Questions

Previous research has been conducted on the link between policies and levels of access as well as on the impact of access disparity in terms of personal and global wealth distribution. Few studies, however, have focussed on the psychosocial impact of inaccessibility, with the aforementioned exception to this being research on these impacts

where the participants were seniors.

As previously discussed, research conducted on the impacts of inaccessibility and the psychosocial well-being of seniors, it was noted that a decrease in the perception of accessibility was associated with increased feelings of loneliness and reduced levels of social capital (Lagacé et al., 2015). Given these findings with an older population, it is important to understand how this same issue may impact people who are members of the working population, particularly as the workforce continues to shift towards jobs that require not only the use of the internet, but digital competence as well. The rapid globalization of information and the ability to communicate easily on a global scale have shifted much of the skills required in the workforce. Since so much information is so readily available, having the static knowledge of that information is less important in the workforce today than is the ability to access the information quickly and adapt it based on contextual need. This skillset is dependent on the ability to access online content, and do so quickly (Chinien, 2011).

To assess the psychosocial impact of internet inaccessibility among working individuals, this research will rely on the Theory of Relative Deprivation (Tajfel & Turner, 1986). The theory posits that when an individual compares their situation (for example, their work situation) to that of others and perceives it as disadvantageous, dissatisfaction and feeling of being treated unfairly will emerge. This postulate has been tested in previous studies related to gender and age discrimination in the workplace. Results suggest that perceptions of unfairness between men and women as well as between young and older workers, have a negative impact on an individual's well-being, lowering self-esteem and leading to disengagement. The model has not been tested when

it comes to internet accessibility and as such, the following questions are posited: 1) Does perceived lack of internet accessibility lead to perceptions of unfairness among low-vision or blind individuals? 2) In turn, do perceptions of unfairness negatively impact their level of self-esteem, and civic engagement? These research questions are illustrated in the following model.

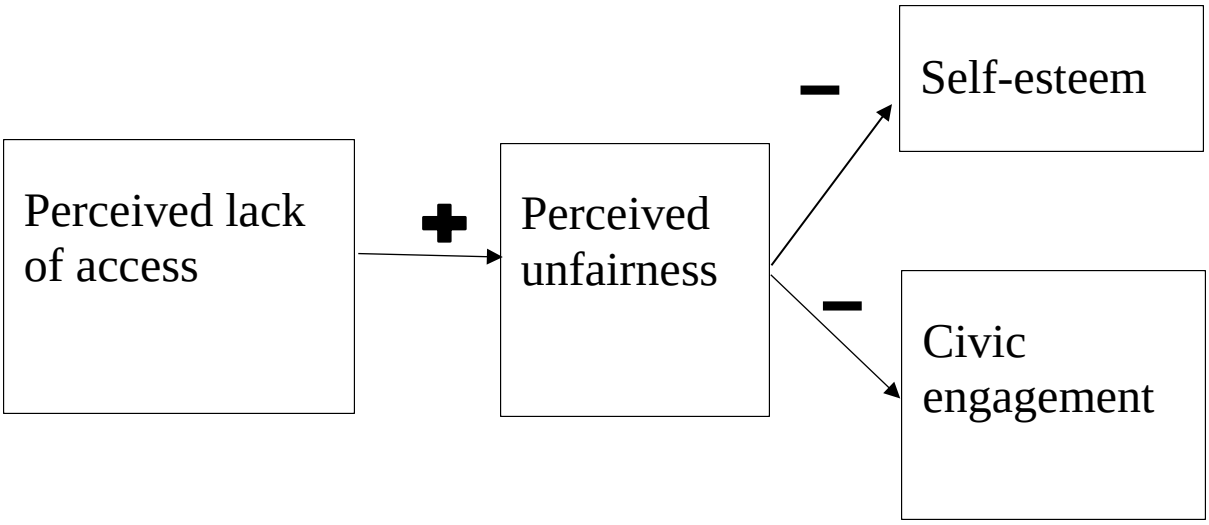


Figure 1: Thesis conceptual diagram

Delimitations

As mentioned, there has already been a great deal of research conducted on the existence of a disparity between access to the internet for those with disabilities and access for those without disabilities. As such, the current study is not focussed on determining if such a divide exists, but instead draws from the social context created by existing research that shows that it does (Dobransky & Hargittaia, 2006) (Ellcessor, 2010). Hence, it focuses on understanding the psychosocial impact on those with blindness or low-vision in the context of internet accessibility.

Thesis Structure

The literature review that follows examines both the social and theoretical context of this research in greater depth. It begins with an overview of accessibility and, in particular a conceptualisation of online accessibility that will be used in this thesis research. This discussion of accessibility continues in a more detailed look into the issues that arise from the gap between online accessibility and inaccessibility as well as a dialog about the causes of this gap, with particular focus on disability. The Theory of Relative Deprivation is then discussed in detail and linked to issues of access before being used as a framework to better show its use in the context of this research. Finally, specific variables contained in the theory and in past research will be brought to light as variables used to create the questionnaire on which the current research relies.

Following the literature review, the methodology chapter will go into further detail regarding the research methods and processes used in this thesis research. In order

to more closely examine the connections between the psychosocial impacts of online inaccessibility on those with disabilities, survey research was conducted with a group of 69 participants who self-identified as either blind or low-vision. The survey was made available in three accessible formats – through an accessible online survey platform, in large-print, and in Braille. The survey, described in detail in the methodology section, measured levels of perceived access, levels of perceived unfairness, levels of civic engagement, and levels of self-esteem. The results gathered from this survey were then examined in relation to one another, to determine if the connections hypothesized in the model were present in the responses received.

Following the discussion of the methodology used in this research, an analysis of the results and their theoretical and practical implications are given.

Chapter 2: Literature Review

This literature review provides an overview and discussion of the relevant theory and context that have guided the methodology and analysis sections of this thesis. It begins with a broad look at the concepts of accessibility, digital divide and second-level digital divide, which are then used to clarify the societal context that forms the basis for the discussion that follows. Following the overview, a more detailed discussion of the existing research and theoretical basis for this thesis research will be provided.

Online Accessibility

Access, in the context of this research, is defined as the ability to obtain or receive services or data, or the ability to approach or enter a place without undue barriers. Accessibility, as a term used in law and research can describe a number of different concepts including access to products, environments, services, as well as access to digital media, known as online accessibility, which is the main focus of this research.

Online accessibility can still be defined relatively broadly, as it can refer to written text in a website, the use of sound, colour, or shape to denote specific meaning on a screen, or even the availability of keyboard commands in software programs. Even further complicating the accepted definition of online accessibility is the ever-changing landscape of digital media, with the recent emergence of smartphones and tablets, accessibility has grown to include mobile applications and alternate methods of navigating mobile hardware designed for able-bodied people (Serra, Carvalho, Ferreira, Vaz, & Freire, 2015) (Díaz-Bossini & Moreno, 2014) (Godinho, Condado, Zacarias, & Lobo, 2015).

With the broad range of meanings that can be derived from the term, it is

important to first specify what is meant in this research when referring to accessibility. Online accessibility will be referred to in the context of this thesis as the availability of internet content that is understandable for people with functional impairments that may otherwise obstruct their access to such content. Online accessibility, as a term, will include functional access to any digital media, or Information and Communications Technology (ICT), that is readily available to members of the general population or that would be made available to an able-bodied individual in the same given context (for example, in a work or school environment). This focus on digital, online content, as opposed to traditional media has been chosen for this research because within the past couple of decades, web and mobile internet access have thrown the general population and, in particular, the global workforce into a state wherein having access to online content is necessary for daily life.

There are a variety of assistive technologies available to support those who have functional impairments that limit their ability to access online content. Screen-reader technology, for example, is used in conjunction with a variety of digital media to allow the user to have written content read aloud for them using the metadata in text and graphical digital content. This is a very common and critical technology that is used by people who have low-vision or blindness and can be useful for everything from reading an article on a website to understanding text on a mobile phone (Mccarthy, Pal, &

Cutrell, 2013). Another common assistive technology for those with disabilities is speech-to-text software that allows an individual to enter digital, written text through verbal language. This technology, like screen-reading technology is particularly helpful to those without vision (Hoffmann, 2008). Unfortunately, while such tools can help mitigate access barriers for online content in many cases, these technologies can only be used effectively if the *content* with which it is used has been designed in an accessible manner. In other words, even though assistive technologies that aid in the consumption of this digital content exist and are improving, the content itself is still largely inaccessible.

Despite the aforementioned policies and laws that exist to ensure accessible online content, much of the digital media that is available today is still inaccessible to those with functional impairments like low-vision or blindness. In other words, assistive technologies are expanding but the content is still not accessible (Jodhan v. Canada (Attorney General), 2010) (Dobransky & Hargittaia, 2006).

Enforcement remains a key problem for online content, particularly due to the issues that are presented for business and public service providers when it comes to updating an existing inaccessible website. Either recruiting a new team of web designers who are already trained in web accessibility, or re-training the existing web-creation team is necessary when modifying a website to make it more accessible, something that requires time and resources (Fichter, 2013).

A common concern for providers of existing content online has been that much of their content currently exists in an inaccessible format. Rather than create an entirely new website that conforms to the prescribed accessibility measures that are in place either in

local law or in new company policies, the solution that is often put into place is to create a secondary, accessible version of the same content (Hofstader, 2004) (Wentz, Jaeger, & Lazar, 2011). While this does often meet the requirements for accessibility, as set out in Canadian and Provincial laws, there are a number of issues that can arise from such a solution. The first concern that can arise from this solution of separation of accessible content online is that of continuing to segregate a subset of the population in their online activities. Those with functional impairments already experience greater levels of social disadvantage than do other members of the general population (Singleton & Darcy, 2013). By introducing these separations in an online environment between the version made for the general public and the version that is accessible to them, even when accessing the same content, the segregating effect is only intensified, particularly in cases where there may be interactive content in a website. The second key issue with this secondary site solution is that having a separate website, which has the sole purpose of replicating the content that already exists, with slight differences to cater to assistive technology users, more work is created for those whose job it is to maintain the website. Updating the main website's content and formatting would be a task that doubles in effort and scope. This is particularly an issue if the accessible website is not necessarily as high a priority as the main one, which is sometimes the case. Because of this lower priority, the secondary, accessible version of the website may suffer from a lower level of upkeep and updates and poorer maintenance if anything goes awry (Wentz, Jaeger, & Lazar, 2011).

Accessibility guidelines.

Accessibility can be implemented online through content itself, for example by using section headers that describe the subsequent content or through using high-contrast colour choices. It can also be realized by creating a website structure that is usable by people with disabilities through the use of features like keyboard navigation or creating more than one way to locate web pages within a website (World Wide Web Consortium (W3C), 2008).

Web Content Accessibility Guidelines 2.0

The most widely used standard for online accessibility globally, is the Web Content Accessibility Guidelines (WCAG) 2.0. This guide was created by the Web Accessibility Initiative in 1999, has been maintained, and updated with the help of a number of global stakeholders as well as accessibility experts (World Wide Web Consortium (W3C), 2008). It has been accepted as an international standard by International Organization for Standardization (ISO) (International Organization for Standardization, 2012) and has been used as the basis for the Canadian Government's own Standard on Web Accessibility and Common Look and Feel Guidelines (Government of Canada, 2011).

WCAG 2.0 gives a good indication of the complexity surrounding creating and using accessible web technologies. The guide consists of four "layers of guidance," beginning with four principles of web accessibility – *perceivable, operable, understandable,* and *robust*.

Perceivable refers to the requirement that information presented, as well as the user interface, must be presented in a way that is perceivable to users. *Operable* means that the navigation and interface components need to be able to be used by those interacting with the content in question. For example, the user interface should not require any interaction that a user cannot perform. *Understandable* does not refer only to the content, though that is included as well. The mode of operation and layout should also be understandable. Finally, to be *robust* means that the content must be able to be reliably interpreted and usable as technologies advance. For example, someone using a screen-reading technology should be able to continue to access content as the technology is updated over time. These fours principles are key, in that if any one of them are not met, people with certain disabilities will be unable to use the content (World Wide Web Consortium (W3C), 2008).

Under these principles are specific guidelines that provide accessibility goals. There are twelve guidelines, each falling under one of the four principles of accessibility. The guidelines that follow in the second level of guidance are the goals that content creators should work towards in order to achieve content accessibility. The key objective of these guidelines is to enable the ability to access information to the greatest number of people possible. For example, Guideline 1.1 states the need for text alternatives for non-text based information. This helps those who have low vision or blindness understand content where graphics or videos are used to convey information. Each success criterion is testable, so that they can be deemed successful or unsuccessful in an objective manner. For example, when working toward the guideline for text alternatives, there is only one Success Criterion, 1.1.1, which is to provide a text alternative that serves the equivalent

purpose. If there is alternative, accessible text then the guideline has been met, objectively (World Wide Web Consortium (W3C), 2008).

Finally, documented techniques for meeting the guidelines and success criteria are provided. Within this final layer of guidance are three levels of accessibility conformance: Level A; Level AA; and Level AAA. At each of these levels, all success criteria at that level must be met for conformance. The success criteria are assigned to one of these three levels based on five factors: whether the success criterion is essential for access; whether it is possible to apply to all sites and types of content; whether it requires skills that could be reasonably achieved by content authors; whether the success criterion would impose limits on the function or aesthetic of the web page; and whether there are no workarounds if the success criterion is not met. The first level of conformance, A-level, is the least stringent. If a website conforms at level A, then it would be minimally accessible including success criteria such as colour not being used as the only visual means of conveying specific information. The second level of conformance is AA. This level is stricter than level A, and includes success criteria such as having text rather than images of indecipherable text in visual presentations of information. The highest level of conformance is level AAA. This level includes such success criteria as having a 7:1 contrast ratio between text and text backgrounds. For example, Guideline 2.1, which requires all functionality to be made available via a keyboard, has multiple success criteria, which distinguish compliance levels. Success Criterion 2.1.1 provides exceptions available to requiring keyboard control, making it level A compliant, but no exceptions are available in Success Criterion 2.1.3, making it level AAA compliant. (World Wide Web Consortium (W3C), 2008).

As one might expect, this complicated nature of the most widely used web accessibility guidelines has created resistance in terms of adoption (Linder, Fontaine-Rainen, & Behling, 2015). In fact, in spite of the existence of detailed guidelines and laws requiring adherence to accessibility standards when creating online content, there is a great deal of pushback and non-compliance among many companies and even among governments that have created these same laws and policies (Jodhan v. Canada (Attorney General), 2010). Low levels of awareness and education surrounding web accessibility may also have been to blame for many of the adoption barriers that exist (Bundrick, Goette, Humphries, & Young, 2006).

One example of slower adoption of accessible content can be seen in the 2011 case of Jodhan v. Attorney General of Canada. The case was made by a visually impaired consultant, Donna Jodhan, who did not have access to Government of Canada documents that were made available to the Canadian public on the internet. These documents were required for her to do her job effectively and reasonable accommodations were not made when she asked. As a result, Jodhan took her case to Federal court. She won her case and the Federal Government of Canada was ordered to make its entire digital media available in an accessible format. This ruling took place in 2011 after the Government of Canada initially put into place a policy for all government departments requiring public-facing documentation to be made accessible in 2001. The *Common Look and Feel (CLF)* accessibility policy within the Government of Canada was a requirement for a decade, and yet few departments had implemented or enforced the policy prior to the Federal Court case, which ordered compliance (Jodhan v. Canada (Attorney General), 2010).

Even when an organization does comply with accessibility regulations, if an Information and Communications Technology (ICT) is not originally created with accessibility measures in place, a common solution is to create a secondary, accessible version of the content, rather than re-create the original media in order to allow all users to have access (Vicente & López, 2010). As long as the content is the same, it might seem like a good solution to the problem; however, the secondary accessible version is often not a main priority for an organization and, therefore, may suffer in terms of maintenance and updating. An example of this is Facebook's secondary, accessible mobile version that was not updated and maintained at the same pace as their primary site (Wentz & Lazar, 2011).

These issues of non-compliance and poor maintenance for accessible versions of ICTs create a gap in the ability to access online content for those with additional accessibility needs. Content that is readily available online for the entire population is also becoming more necessary to access, as more services move to a digital platform. This gap in access is known as the digital divide.

Law and policy.

There are many considerations to take into account when assessing whether media is accessible and even more when creating accessibility online. Because of the complex nature of online accessibility, many sets of policies and guidelines have been created to help with the implementation of accessibility online (Government of Ontario, 2016) (City of Ottawa, 2012) (World Wide Web Consortium (W3C), 2008). For example, the Common Look and Feel standard implemented by the Canadian Government for use in all government communications, was created in order to provide consistency in government documentation, but also was designed in order to ensure that all government

communications would be created in an accessible manner. The Standard on Web Accessibility, replacing the Common Look and Feel Guidelines, further emphasized the necessity of accessibility in government communications, including traditional websites as well as web applications (Government of Canada, 2011).

Digital divide.

The term "digital divide" is used to describe the gap between those who have access to online technologies and those who do not (Dobransky & Hargittaia, 2006). This gap can be caused by a number of factors and has been attributed by previous researchers to factors including skill, age (Rosedale, 2015), geography, economic factors (Khan, Miankhel, & Nawaz, 2012), disability (Ellcessor, 2010), or as is often the case, a combination of factors.

The digital divide exists on many levels. In terms of a global digital divide, there is a pronounced difference between those who have access to the internet and those who do not based on their geographic location. This geographical example of the existence of a digital divide, is likely a gap in access to the internet due to economic factors (both of a nation as well as of individual wealth). Internet access requires specific infrastructure and this has the potential to lead to a digital divide globally between nations that have the ability to create this infrastructure for their citizens and those that do not. For many poorer countries, creating the infrastructure for internet access can seem a lower priority than things such as social programs (Khan, Miankhel, & Nawaz, 2012). This infrastructure barrier can also contribute to a greater disparity in terms of internet access between those in rural areas and those in urban centres (Rooksby, Weckert, & Lucas, 2002).

For those who live in countries with higher internet usage and the necessary infrastructure, personal wealth can be a deciding factor in whether an internet access gap exists at the individual level. Statistics Canada showed that in 2012, those with the lowest levels of household income were 39.7% less likely to have internet access at home than were those in the highest household income quartile (Statistics Canada, 2013).

The issue of digital divide has become more important as internet technologies become more prevalent in our everyday lives. In many cases, there are few, poor, or no alternatives to online content (Jodhan v. Canada (Attorney General), 2010) and the internet is increasingly necessary when accessing information regarding health care (Rosedale, 2015), employment (Lindsay, 2005), and other essential resources (Khan, Miankhel, & Nawaz, 2012).

Digital divide and disability.

Considering the fact that citizens with disabilities not only face accessibility barriers in terms of design, but are also more likely to live below the poverty line than are their able-bodied counterparts (Wall, 2017), the disability digital divide is not surprising. Compounding the issue, even those who have the financial ability to access the internet may not always be able to use it. As discussed previously, those with functional impairments often require assistive technologies to access online content and, even then, are restricted to only ICTs that have been designed in an accessible way. This issue of prevalent financial hardships paired with inaccessible online content creates a situation wherein those with disabilities are less likely to access the internet regularly than are those without any functional impairments (Statistics Canada, 2013).

People with vision impairments seem to be more strongly affected by this non-access. Those with mobility, learning, or hearing impairments seem not to have the same barriers to access as do those with visual impairments beyond personal finances (Dobransky & Hargittaia, 2006). In the United States, the Department of Commerce found that while those with disabilities were less likely to have internet access, as were those without disabilities (21.6% compared to 42.1%), there were noticeable differences even within the scope of those who had functional impairments, between specific disabilities. Internet access rates for people with blindness or low vision had lower rates of online access (Vicente & López, 2010). This is, perhaps, unsurprising when considering the bulk of online interaction for able-bodied people involves a significant visual component. If one considers that many of these web pages do not have accommodations available for those with blindness or low-vision, then the lower rate of online access becomes clear. However, while disability in itself can create lower levels of access, socioeconomic status combined with the nature of inaccessible digital media can cause major accessibility issues, especially those who are blind or have low vision.

The issue of online accessibility for those with disabilities has been studied at length with the focus of whether or not sufficient access exists. What is shown, time and time again, is that the digital divide does exist for those with disabilities. Across multiple studies, levels of access to online communications and services for those with disabilities seem to be far below the levels of access enjoyed by those who do not have a functional impairment and have no requirement for additional enhancement software/hardware. Those with disabilities are less likely than their able-bodied peers to do banking, get news, shop, take courses, or search for jobs online (Vicente & López, 2010). In another study by Macdonald and Clayton (2010), it was found that even with the existence of

assistive technologies for those with disabilities, levels of engagement online were not improved (Macdonald & Clayton, 2012).

Second-level digital divide.

While a digital divide can be created by a lack of access to the internet due to barriers of wealth or infrastructure, more commonly a digital divide is created by compounding factors. In many cases, having a barrier to access limits a person's use of a technology to the point where the ability to use the technology even if accessed is reduced. One accessibility issue that causes another accessibility issue, which in turn further restricts internet access, is referred to as a second-level digital divide.

Age presents a good example of a second-level digital divide. Chronological age itself does not necessarily account for the digital divide between older adults and younger ones, sometimes referred to as the "grey digital divide" (Lagacé, Charmarkeh, Zaky, & Firzly, 2016). A potential reason for the grey digital divide is that the skills needed to use the internet or the confidence to learn are not as prevalent in that age group. This lack of skill needed to use the internet in spite of physical access is what it means to have a second-level digital divide (Millward, 2003).

While disability alone is enough to cause barriers to accessing the internet (Jodhan v. Canada (Attorney General), 2010), a second-level digital divide has the potential to limit a person's use of the internet even when it's made accessible, particularly when there has been a gap in the learning due to prolonged inaccessibility prior to changes being made in terms of policy and resources. For example, individuals who have disabilities are less likely to have access to the internet, or even computers, in their homes (Dobransky & Hargittaia, 2006). When you consider that those with

disabilities are more likely to live below the poverty line, with 23% of those with a disability in Canada considered low income, compared to 9% of those without a disability, (Wall, 2017), it is not surprising that there are lower rates of access to internet in the home given that internet retail rates are not regulated in Canada (Canadian Radio-television and Telecommunications Commission, 2016). If a person then does not have access to the internet, even accessible internet content may be rendered inaccessible to the user, due to the fact that they have not gained the same level of digital literacy as someone who has had internet access for a longer period of time.

In spite of the extensive research into the existence of the digital divide for those who have functional impairments, the research seems limited in terms of human impacts. Research on the impacts of inaccessibility on finances, education, and career are common and do show that lack of access causes hardship for those with disabilities living in a technology-driven society without reliable online accessibility (Dobransky & Hargittaia, 2006) (Macdonald & Clayton, 2012). However, research that examines the effect on a personal level in terms of psychosocial impacts is limited. These personal impacts are important to study, as they could reconcile the direct link between lack of access and factors such as finances, education, and career. Alternatively, inaccessibility could lead directly to fewer education and career possibilities, which could then affect well-being.

Access and Well-Being

While research into the potential links between online accessibility and well-being is difficult to find, there does exist more research into the connection between well-being and accessibility in other contexts. Considering the links that have been made in previous research between online accessibility and overall accessibility, one could reasonably

conclude that connections that have been made between accessibility in a variety of contexts would translate to accessibility in terms of online communications.

A 2015 study looking into the subjective well-being of older gay and lesbian people found that one of the key predictors of well-being was accessibility in terms of community services (Sagie, 2015). While it can be argued that accessibility itself may not be the one and only indicator of well-being, having access to these services that increase well-being was indicated as a major factor when considering the subjective well-being of the group studied. Another example that links accessibility and well-being comes from research into women's access to health care in developing countries. Again, it was found that women who have better access to health care in the developing world had higher levels of well-being overall (Nash Ojanuga & Gilbert, 1992). It stands to reason that when a person has limited or no access to services such as healthcare, and online technologies they feel dissatisfaction and a lower sense of well-being when comparing their situation to that of others. This is the foundation of the Theory of Relative Deprivation.

Theory of Relative Deprivation

The Theory of Relative Deprivation (RD) proposes the idea that individuals who make negative social comparisons can then perceive that they are being treated unfairly in a given social context (Tajfel & Turner, 1986) (Bernstein & Crosby, 1980). Relative deprivation can be understood in three stages. The first stage of relative deprivation is simply the comparison of oneself to other people or groups. If this comparison is perceived as negative, then a person can progress to the second stage, wherein this comparison may lead to the perception that an individual is at a disadvantage. This

perception then may lead to the third stage, which is that this perceived disadvantage, that was shaped by a negative comparison of social situations, may then generate negative emotions, such as the feeling of unfairness or dissatisfaction with one's situation (Smith, Pettigrew, Pippin, & Bialosiewicz, 2012) as well as negative, disengaging behaviours, such as a higher intent to retire or leave one's job (Tougas, Lagacé, De La Sablonnière, & Kocum, 2004) (Beaton, 1995).

Since its initial use in research, the theory of RD has been used to frame studies in a variety of contexts, from research examining scores found in tests for Grade Point Averages (GPA) and career choices for men graduating from college (Davis, 1966), to perceptions of underrepresentation of women in management positions (Beaton, 1995). Previous research has also shown an association between feelings of relative deprivation and negative outcomes. For example, Tougas, Lagacé, De La Sablonnière, and Kocum (2004) found that relative deprivation was correlated with lower self-esteem and disengaging behaviours in their study on ageism and retirement.

Moreover, previous studies have shown that there is a positive correlation between the perceived fairness and personal well-being of an individual. In a study of over 2,000 people in Beijing, participants were asked via a telephone interview about their perceived fairness regarding social security and income distribution policies (Sun & Xiao, 2012). The findings of the study indicate that there was a positive correlation between the respondent's perceived fairness of these policies and their subjective well-being, meaning those who had higher levels of perceived fairness also had higher levels of subjective well-being. Another study that focused on the well-being of workers in the Italian social services sector showed that perceived fairness is more strongly correlated to

the well-being of workers than is wage or disutility of effort (Tortia, 2008). In light of the results of such studies, it is plausible to hypothesize that feelings of unfairness in terms of online accessibility would yield negative effects, precisely in terms of well-being.

Because of its relevance to the societal context surrounding the topic of this thesis and due to its previous success as a framework for similar research, the Theory of Relative Deprivation was chosen as a theoretical basis for the underlying research questions and the model proposed (see Figure 1).

By determining whether online inaccessibility generates similar results in terms of well-being as other groups that have been examined under the framework of the Theory of RD, this research will attempt to broaden the knowledge of relative deprivation theory, and in particular examine the understanding of relative deprivation in the context of disability and the human effects of inaccessibility in a growing online environment.

Perceptions of fairness.

As relative deprivation theory is being used as the theoretical context for this thesis research, the perceptions of fairness, rather than the objective inequality of online access are of significant relevance to the research at hand. In fact, it has been shown that the subjective perception of inequality is actually even more powerful from a psychosocial standpoint than is objective unfairness (Ryan, 2010).

The perception of fairness, rather than potential objectivity in measuring fairness has played a role in previous research and has, in the past, aligned. For example, research has shown that many people with disabilities have felt that they were discriminated against in terms of employment, with between 7%-43.6% reporting that they felt that they had been refused a job based on their disability with variation based on age, employment status, gender and severity of disability (Turcotte, 2014). While this is in itself a concern,

those feelings of discrimination may have some basis in observable fact as well. In 2011, the employment rate among individuals in Canada with a mild disability was 68%, 54% for individuals with a moderate disability, 42% for those with a severe disability, and 26% among those with a very severe disability (Turcotte, 2014).

Previous research has consistently shown that feelings of relative deprivation usually (if not always) generate feelings of dissatisfaction. This dissatisfaction then leads to negative outcomes in terms of psychological social well-being.

Relative deprivation can be seen in terms of accessibility when examining the case of Jodhan v. Canada through the lens of this theory. In the case of Jodhan v. Canada, a consultant named Donna Jodhan, who was a legally blind Canadian, was unable to access federal government documents that she needed for her work in an accessible format, despite multiple attempts. The ruling of the case was in Jodhan's favour and the federal government was required to make all documentation available to the public accessible. Throughout the duration of her case, however, themes from the theory of relative deprivation were brought to light. Through the act of taking her issue to court, Jodhan demonstrated strong feelings of relative deprivation. She indicated during the case that her lower levels of access (social comparison) resulted in frustration and the feeling that she had lost some degree of independence (feelings of dissatisfaction with one's situation). These negative outcomes resulting from her feelings of being unfairly disadvantaged were the likely catalyst that caused Jodhan to bring her case before the Federal Court of Canada (Jodhan v. Canada (Attorney General), 2010).

Connections to well-being.

There have been multiple studies focussing on the link between relative deprivation and well-being in a variety of contexts. The overwhelming result of this research has been that there is, in fact, a link between the two in the contexts studied. One such example is a 2004 study that sought to investigate the connection between the relative deprivation and the subjective well-being of the participants. Using wealth and perception of wealth to measure relative deprivation of participants, it was found that being wealthy was not as much a catalyst for higher subjective well-being of participants as was the perception of being wealthier than one's peers. This holds that there is a link between the relative deprivation in the context of wealth and subjective well-being (D'Ambrosio & Frick, 2004).

Another example of relative deprivation based on perceived economic status can be seen in research in research with participants drawn from a pool of residents of public housing who were chosen as potential participants in a self-sufficiency intervention. Again, this research found that having a lower economic status was associated with a negative self-image (Crawford, 2004).

A non-financial example can be seen in research on the aged. Looking at the perceptions of relative deprivation based on age, participating retirees who reported greater levels of relative deprivation when compared to younger workers also tended to have lowered sense of satisfaction with their lives and a lowered self-esteem (Tougas, Lagacé, Sablonnière, & Kocum, 2004).

Self-Esteem

Self-esteem is an important facet of overall well-being and has been shown in research to be important in mitigating other negative emotions and impacts. It was found to be a strong negative predictor of depressed mood and anger for sexually abused adolescents, meaning that higher levels of self-esteem were associated with lower levels of depression and anger (Asgeirsdottir, Gudjonsson, Sigurdsson, & Sigfusdottir, 2010).

According to research examining the link between relative deprivation and well-being in aging populations, lower levels of self-esteem is one of the measures used to indicate the negative consequences of personal feelings of deprivation (Tougas, Lagacé, De La Sablonnière, & Kocum, 2004). This is important to note for this research as it indicates that not only is having a lower level of self-esteem a measurably negative psychosocial impact, it has been used in prior research to study the negative emotional impacts of relative deprivation.

Civic Engagement

Because self-esteem and civic engagement have been used as key indicators of past research into well-being, it is troubling to note that those who are suffering from the digital divide are not only less likely to have immediate access to information, but they are also more likely to have less engagement in social, economic and political activities as well (Macdonald & Clayton, 2012). Those who remain disconnected from technology are more likely also to remain excluded from mainstream social, economic and political activities. Therefore, greater access to and use of technology is positioned as a key tool for addressing such social problems (Macdonald & Clayton, 2012).

In the context of this research, civic engagement represents the behavioural element of the third stage of the Theory of Relative Deprivation. Focussing on participation in the general community, in terms of the social behaviours of collaboration with others and staying informed of community events, this variable measures engagement within one's community.

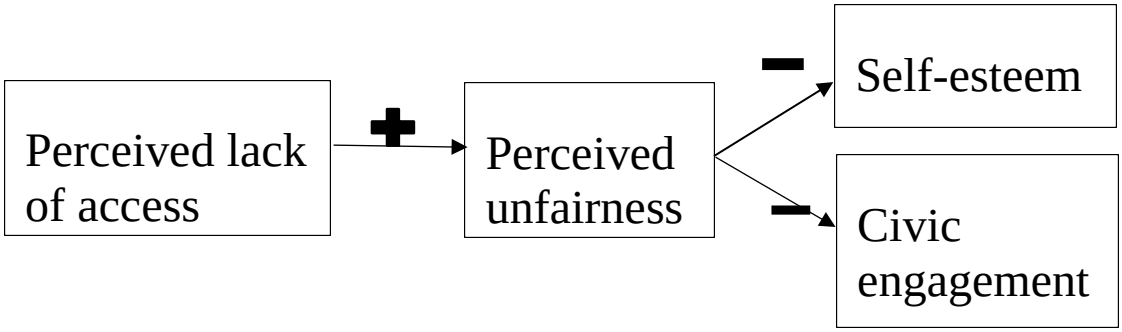
Research Questions

As mentioned above, the research questions that will be examined in this thesis research are1) Does perceived lack of internet accessibility lead to perceptions of unfairness among low-vision or blind individuals? 2) In turn, do perceptions of unfairness negatively impact their level of self-esteem, and civic engagement?

The research discussed in this literature review shows clearly the inequality of access to online content between those with disabilities and those without disabilities. Because of this social context of inequality to such a prominent form of communication and a recognized medium through which the general population accesses services, this thesis will attempt to examine this issue by exploring the personal impacts on those who face this inequality.

Impacts of the disability digital divide are well documented from an objective standpoint. Functional impairments lead to lower levels of internet use, but also to lower socioeconomic status, lower levels of higher education, and higher unemployment rates (Statistics Canada, 2013). While these are all things that one would expect to be detrimental to well-being, the link between inaccessibility and well-being has not yet been examined to the extent that this thesis research intends.

The following model, which is a facsimile of Figure 1, is an illustrative example of the impact of perceived lack of access to online information from individuals with low vision on their well-being, precisely on self-esteem and civic engagement.



Chapter 3:Methodology

The research strategy employed for this thesis was chosen to allow for the best measurement of the links between variables under study (perception of access, perception of fairness in regards to access, self-esteem and civic engagement) as well as the issues that arose from having a limited sample group in a broad geographical setting.

Precisely, by limiting participation in this research to those who are partially or fully blind, millions of members of the Canadian population are eliminated, leaving a potential participant pool of only approximately 500,000 (Gordon, 2017), before accounting for age limitations in this research. This means that if sampling was limited to within the geographic area in which the researchers reside (Ottawa, Canada), the population from which to recruit blind and low-vision participants would be severely limited. In order to reach a broader pool of potential participants, a self-report survey model was chosen as the tool through which the data was collected, rather than an interview model. This allowed the survey to be distributed more widely to any potential participants who have connections to various third-party organizations that agreed to help in this process. The organizations that helped to distribute the request for participants were the National Educational Association of Disabled Students (NEADS), the Québec Federation of the Blind (QFB), the Get Together with Technology (GTT) program, Independent Living Sudbury Manitoulin (ILSM), and the University of Ottawa Centre for Students with Disabilities.

Across Canada, requests were sent to the aforementioned groups, centres, post-secondary organizations that worked with disabled students, and other organizations that may have the reach needed to contact people who would be suitable to participate in this

research. These groups were provided the survey invitation and link (see Appendix B) to their group members through email, or via newsletters and social media. Following organizational distribution, those individuals who wished to participate in the survey could then either use the link provided to use the accessible online version of the survey, hosted by FluidSurveys, or could request a large-print or Braille version of the survey, through the organization that contacted them, or using the researcher contact information found in the invitation.

The participant group consisting of low-vision and blind working-age adults was targeted as they have been shown in past research to be particularly disadvantaged in terms of internet accessibility (Vicente & López, 2010). A working-age group was chosen, as it is a more accessible group, allowing the use of a broader network of organizations with which to collaborate, such as universities and outreach programs. Choosing to research this age group also allows for focussing the research and eliminating the compounding factors of age on accessibility, such as inexperience and cultural aspects.

Accessible versions of the survey were made available to potential participants through secondary organizations in order to maintain anonymity for those choosing to participate in this research. Completed surveys were then assessed using IBM's SPSS software to determine whether there were statistically significant correlations between the variables tested.

Sample of Participants

The participant pool consisted of people in Canada who identified as low-vision or blind, who were between the ages of 21-65.

Given the findings in previous research into disability and the digital divide showing that the impact of inaccessibility online on those with vision impairments is greater than for those with other disabilities (Vicente & López, 2010), only participants with low-vision or blindness were invited to participant in this survey. Specifically, the targeted participant pool for this research have low-vision or blindness to the extent that they require additional accessibility technological solutions in order to consume online communications. These participants were invited to take part in the survey if they self-identified as low-vision or blind and were not required to provide any additional proof of their disability.

The scope of participation was limited to working age participants in order to focus the research and distinguish the results from previous research on the impacts on inaccessibility on the elderly. As noted, the working-age group were also more easily accessible through partnering organizations. The age range chosen was from 21-65, limiting the range to those who were pre-retirement age (acknowledging that while there are many individuals in Canada who continue to work beyond the age of 65, this is the age at which an individual may begin to collect benefits from the Canadian Pension Plan without a reduction (Employment and Social Development Canada, 2016)).

Demographic Profile of Participants

The participants were contacted via a number of Canadian organizations that work with those who may experience low-vision or blindness. Because recruiting was done by third party organizations, the number of potential respondents to the survey is not easily determinable. There were 69 respondents who completed the questionnaire. As a result, the majority of those who took the survey used Canadian IP addresses and were,

presumably, from Canada. One exception was that of one participant who used an Indian IP address. This is shown in the table below. It is not possible to know whether this participant was in India or used a proxy server located there when completing the survey. Due to the information at hand, the participant pool will be treated as being predominantly Canadian for the purposes of data analysis and interpretation.

		Frequency	Percentage	Valid percentage	Cumulative percentage
Valid		8	12.7	12.7	12.7
	Alberta	8	12.7	12.7	25.4
	British Columbia	9	14.3	14.3	39.7
	India	1	1.6	1.6	41.3
	New Brunswick	3	4.8	4.8	46.0
	Newfoundland and Labrador	3	4.8	4.8	50.8
	Nova Scotia	2	3.2	3.2	54.0
	Ontario	24	38.1	38.1	92.1
	Quebec	4	6.3	6.3	98.4
	Saskatchewan	1	1.6	1.6	100.0
	Total	63	100.0	100.0	

Table 1: Participant location

Survey Design

There has been quantitative research conducted using validated scales for most of the variables that were chosen for study in this thesis, so a quantitative survey consisting of previously used scales (some modified to better align the topic of accessibility and the internet) was created and offered through an accessible online platform as well as in accessible print formats.

While it may seem counter-intuitive to recruit and administer a survey focussing on online accessibility through an online platform, it is important to realize that this research is dealing with the impacts of inaccessible online content, rather than internet "content" in general. The online version of the survey was completely accessible as per WCAG 2.0 requirements at the AAA level. The issue of second-level digital divide, in that having barriers to access may reduce one's time spent online and compound this issue of online access through lower levels of digital literacy, was addressed by also creating the option of having a printed copy of the survey (in a large-print format or in Braille, as requested) sent to participants who felt more comfortable with this format.

The model used to exemplify the Theory of Relative Deprivation in the context of online inaccessibility for those with low vision or blindness, gave rise to four key variables. These variables were drawn upon in designing the research questions and, in turn, creating the survey. The survey itself consists of four scales each focussing on one of the key variables that were being researched: perception of online access; perception of fairness; civic engagement; and self-esteem. While pilot testing for these scales would ideally have been done with a larger pool of participants, the scales that were selected have a high degree of internal validity and have been used in a variety of contexts.

Because of these reasons, no pilot testing was done.

Perception of online access.

Perception of online access is an important variable to test. This is because for the purposes of this research and following the Theory of Relative Deprivation, whether or not members of the public with blindness or low-vision have the same level of access to online content as does the general population is less important than whether they feel that they have lower levels of access. Taking this into account, perception of accessibility rather than objective levels of comparative access were assessed. Perceived level of access was measured using an adapted version of the existing multi-item scale that was used by Porter and Donthu (2006) to measure perceived barriers to accessing internet content. This scale is comprised of 15 items and is comprised of five subsections: perceived ease of use; perceived usefulness; perceived access barriers; attitude toward internet usage; and internet usage. This scale was designed for use to measure the perceptions of online access based on cost, rather than ability. As such, it was adapted to the purpose of the current research, i.e. access based on disability. Following are examples of items: “I do not have the ability to get Internet access for personal use” and “I cannot access the Internet for personal use” (Porter & Donthu, 2006). All items were answered using a 4-point scale (1: totally disagree; 4: totally agree). Internal consistency is available for each subset of items, rather than the scale as a whole as there is some degree of variance between them. For perceived ease of use, the Cronbach’s alpha is .92. For perceived usefulness, the Cronbach’s alpha is .83. For perceived access barriers, the Cronbach’s alpha is .93. For attitude, the Cronbach’s alpha is .90, and for internet usages, the Cronbach’s alpha is .93. All items were grouped in a composite score and the higher the score, the more positive the perceptions of online access.

Perception of fairness.

The second variable that was included in the creation of this survey was the perception of fairness (in regards to accessibility). This comes into focus due to the theoretical framework that was provided by the Theory of Relative Deprivation. As indicated in past research, the perception of fairness can be affected by the perception of access and can then have the potential to affect the well-being of the person in question. Perceived fairness was measured using an adapted version of the Adapted Social Capital Assessment Tool (SASCAT). This validated 9-item tool focusses on the measurement of the broad concept of social capital, defined as "social networks and their associated norms of reciprocity" (Putnam, 2004). It includes a subscale of four items that has been used to assess if a participant's perceives he/she is fully and fairly integrated into a community. Examples of items are as follows; "Do you feel as though you are really a part of this community?" and "Do you think that the majority of people in this community would try to take advantage of you if they got the chance?" (De Silva, Huttly, Harpham, & Kenward, 2007). This subscale was used, rather than the entirety of the adapted SASCAT, because the measure of social capital was not the intent, by rather the perception of fairness was the goal of the measurement. This subset has been used in previous research to determine the perception of fairness as a component of social capital (De Silva, Huttly, Harpham, & Kenward, 2007). All items were answered as "Yes" or "No."

Self-esteem.

In order to determine participant's levels of self-esteem, the Rosenberg Self-Esteem Scale was used. This 10-item scale, initially designed for use with high school students, has been used since to determine levels of self-esteem in adult populations as well (Rosenberg, 1979). Internal consistency for this scale has been determined using composite reliability with values greater that .60 being considered acceptable. For the self-esteem factor of the scale, the internal consistency was satisfactory ($\rho_c = .79$). All items were grouped in a composite score and the higher the score, the higher participant's self-esteem.

Civic engagement.

The level of civic engagement that was reported by the participants in this survey was measured using and adapting the Civic Engagement Scale (CES) (Doolittle & Faul, 2013). The CES was initially created to measure civic engagement in the education and social work fields created specifically for use by those in the education and social work fields, but as argued by Doolittle and Faul (2013), "civic engagement" is measured as a broad concept and can be used in other contexts. The scale consists of 14 Likert questions subdivided into two subscales: civic attitudes (with items such as "I believe that it is important to volunteer"); and civic behaviours (with items such as "I help members of my community"). All items were answered using a 4-point scale (1: totally disagree; 4: totally agree). The Cronbach's alpha level for the civic attitudes subscale is .91 and the Cronbach's alpha level for the civic behaviours subscale is .85 (Doolittle & Faul, 2013). All items were grouped in a composite score; higher scores expressed high levels of civic engagement.

Chapter 4:Analysis

Data Cleaning

Cleaning of data was conducted over a two-step process. First, when necessary, some of the item scores were recoded in order to match the consistency of all item scores for the perception of access, self-esteem. Specifically, if a question is posed in the negative then the response values were recoded as 1=4, 2=3, 3=, and 4=1 in order to ensure that the number values were consistent with the items that were worded in the positive.

For the perception of access scale, the scores for the following two items were recoded:

1. I do not have the ability to get internet access for personal use.
2. I cannot access the internet for personal use.

For the self-esteem scale, the scores for the following items were recoded:

1. At times, I think I am no good at all.
2. I feel I do not have much to be proud of.
3. I certainly feel useless at times.
4. I wish I could have more respect for myself.
5. All in all, I am inclined to feel that I am a failure.

Following this step, a mean (global) score was calculated for each of these three scales in order to generate descriptive statistics and determine the correlational link between each variable under study. Finally, a mean score was calculated following the verification of internal reliability of these three scales, which were revealed to be acceptable (i.e. all alpha

values were beyond .70 or equivalent internal reliability was met).

Data Analysis

Data was analysed using SPSS software from IBM Data analysis in a two-step process. First, descriptive statistics was generated (including frequency tables, measures of central tendency and dispersion). Second, correlations were calculated to assess how each concept is associated with one another.

Descriptive statistics.

The following four tables show the results that were gathered from each item in the subscale used to measure the perception of fairness. In each of the following, the value of 1 represents the negative (“no”) indication and the value of 2 (“yes”) represents the positive. Results suggest that, in general, the majority participants perceive they are treated fairly within their community, notably in terms of being able to trust members of such community and of feeling integrated in it.

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	1	17	27.0	38.6	38.6
	2	27	42.9	61.4	100.0
	Total	44	69.8	100.0	
Missing Data	System	19	30.2		
Total		63	100.0		

Table 2: Question - Do you think that the majority of people in this community would try to take advantage of you if they got the chance?

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	1	11	17.5	26.8	26.8
	2	30	47.6	73.2	100.0
	Total	41	65.1	100.0	
Missing Data	System	22	34.9		
Total		63	100.0		

Table 3: Question - Do the majority of people in this community generally get along?

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	1	14	22.2	33.3	33.3
	2	28	44.4	66.7	100.0
	Total	42	66.7	100.0	
Missing Data	System	21	33.3		
Total		63	100.0		

Table 4: Question - In general can the majority of people in this community be trusted?

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	1	13	20.6	31.7	31.7
	2	28	44.4	68.3	100.0
	Total	41	65.1	100.0	
Missing Data	System	22	34.9		
Total		63	100.0		

Table 5: Question - Do you feel as though you are really a part of this community?

The following table of statistics shows the grouped totals from the responses to the remaining scales: perception of access (ACCESSGLOBAL), self-esteem (ESTEEMGLOBAL), and civic engagement (CIVICGLOBAL). Central tendency values (mean and standard deviation) suggest that participants have a positive perception of their level of access to online technologies (mean is 3.11; median is 3.08), feel engaged from a

civic perspective (mean = 3.15; median = 3.29) and experience rather high levels of self-esteem (mean of 3.18 and median of 3.20). Standard deviation values are all under 1, which suggests a normal distribution for each variable.

		ACCESSGLOBAL	CIVICGLOBAL	ESTEEMGLOBAL
N	Valid	41	36	39
	Missing	22	27	24
Mean		3.11	3.15	3.18
Median		3.08	3.29	3.20
Standard Deviation		.26	.49	.44

Table 6: Statistics

Association Between Variables

In order to determine the extent to which variables under study are associated with one another, Pearson correlation and t-tests were conducted. Results reveal that while the expected link between perception of access and perception of fairness was not confirmed (Pearson value of 0.197; $p < .05$), a significant difference was found between participants' who perceived their situation to be fair and those who did not in terms of self-esteem (see Tables 8-15). With t-tests performed on each item in the perception of fairness scale indicating that three of the items were correlated with self-esteem. Furthermore, positive and significant correlations were found between the variables "access and self-esteem" (Pearson value of 0.353; $p < .05$) as well as "self-esteem and civic engagement" (Pearson value of 0.443; $p < .05$). Results are further detailed in the following tables.

Table 7 shows the Pearson correlation between the values of the global perception of fairness and the global perception of access variables. As mentioned, these values were taken from an amalgamation of the individual scores for each variable.

		ACCESSGLOBAL	FAIRNESS GLOBAL
ACCESSGLOBAL	Pearson Correlation	1	.197
	Sig. (2-tailed)		.272
	N	38	33
FAIRNESS GLOBAL	Pearson Correlation	.197	1
	Sig. (2-tailed)	.272	
	N	33	35

Table 7: Pearson correlation for perception of access and perception of fairness

Table 8 shows the Pearson correlation between the global civic engagement values, the global perceptions of access values, and the global self-esteem values.

		CIVIC GLOBAL	ACCESSGLOBAL	ESTEEM GLOBAL
CIVIC GLOBAL	Pearson Correlation	1	.072	.443**
	Sig. (bilateral)		.696	.008
	N	36	32	35
ACCESSGLOBAL	Pearson Correlation	.072	1	.353*
	Sig. (bilateral)	.696		.041
	N	32	41	34
ESTEEM GLOBAL	Pearson Correlation	.443**	.353*	1
	Sig. (bilateral)	.008	.041	
	N	35	34	39

**. The correlation is significant at the level 0.01 (bilateral).

*. The correlation is significant at the level 0.05 (bilateral)

Table 8: Pearson correlations for civic engagement, access, and self-esteem

Table 8 shows a moderate and positive correlation between the perception of having access to online technologies and participants' level of self-esteem (Pearson value of 0.353; $p < .05$). Civic engagement is also positively associated with self-esteem (Pearson value of 0.443; $p < .05$).

To determine the extent to which perception of fairness influenced participants' well-being (through levels of self-esteem) and social participation (through levels of civic engagement), a series of t-tests were conducted on each item of the fairness scale. Results in Tables 9-16 suggest that perception of fairness does indeed have a significant impact on self-esteem. Specifically, a t-test was run on each of the four perception of fairness

questions. T values were all significant ($p < .05$) except for the question regarding the extent to which participants perceive that members of the community get along. Precisely, for participants who feel their situation to be unfair have a lower self-esteem than those who feel it is fair. It is plausible that the question relating to how participants perceive the extent to which members of their community get along with one another did not speak to participants for their individual experience, particularly in reference to online communities.

	Do you think that the majority of people in this community would try to take advantage of you if they got the chance?	N	Average	Ecart type	Average standard error
CIVICGLOBAL	1	14	3.1990	.52052	.13911
	2	21	3.0850	.47682	.10405
ESTEEMGLOBAL	1	15	2.9667	.43205	.11155
	2	23	3.3087	.39990	.08339

Table 9: T test for item "Do you think that the majority of people in this community would try to take advantage of you if they got the chance?"

		Levene test on the equality of variances		T test for averages						
									Confidence interval of the difference at 95 %	
		F	Sig.	t	ddl	Sig. (bilateral)	Average difference	Standard error difference	Inferior	Superior
CIVICGLOBAL	Assumption of equal variances	.082	.777	.668	33	.509	.11395	.17062	-.23318	.46107
	Assumption of unequal variances			.656	26.270	.518	.11395	.17372	-.24297	.47086
ESTEEMGLOBAL	Assumption of equal variances	.174	.679	-2.497	36	.017	-.34203	.13697	-.61981	-.06425
	Assumption of unequal variances			-2.456	28.377	.020	-.34203	.13928	-.62715	-.05691

Table 10: Testing Independent Samples for item "Do you think that the majority of people in this community would try to take advantage of you if they got the chance?"

	In general can the majority of people in this community be trusted?	N	Average	Ecart type	Average standard error
CIVICGLOBAL	1	12	3.1250	.44776	.12926
	2	23	3.1335	.52103	.10864
ESTEEMGLOBAL	1	13	2.8846	.36480	.10118
	2	25	3.3240	.40546	.08109

Table 11: T test for item "In general can the majority of people in this community be trusted?"

		Levene test on the equality of variances		T test for averages						
									Confidence interval of the difference at 95 %	
		F	Sig.	t	ddl	Sig. (bilateral)	Average difference	Standard error difference	Inferior	Superior
CIVICGLOBAL	Assumption of equal variances	.375	.544	-.048	33	.962	-.00854	.17727	-.36920	.35212
	Assumption of unequal variances			-,051	25.635	.960	-.00854	.16885	-.35586	.33878
ESTEEMGLOBAL	Assumption of equal variances	.439	.512	-3,275	36	.002	-.43938	.13417	-.71149	-.16728
	Assumption of unequal variances			-3,389	26.833	.002	-.43938	.12966	-.70551	-.17326

Table 12: Testing independent samples for item "In general can the majority of people in this community be trusted?"

	Do the majority of people in this community generally get along?	N	Average	Ecart type	Average standard error
CIVICGLOBAL	1	9	3.2698	.50353	.16784
	2	26	3.1099	.50152	.09836
ESTEEMGLOBAL	1	10	3.0200	.38816	.12275
	2	28	3.2357	.45315	.08564

Table 13: T test for item "Do the majority of people in this community generally get along?"

		Levene test on the equality of variances		T test for averages						
									Confidence interval of the difference at 95 %	
		F	Sig.	t	ddl	Sig. (bilateral)	Difference Average	Standard error difference	Inferior	Superior
CIVICGLOBAL	Assumption of equal variances	.002	.967	.824	33	.416	.15995	.19415	-.23505	.55495
	Assumption of unequal variances			.822	13.913	.425	,15995	.19454	-.25754	.57744
ESTEEM GLOBAL	Assumption of equal variances	.108	.745	-1.337	36	.189	-.21571	.16129	-.54282	.11139
	Assumption of unequal variances			-1.441	18.438	.166	-.21571	.14967	-.52962	.09819

Table 14: Testing independent samples for item "Do the majority of people in this community generally get along?"

	Do you feel as though you are really a part of this community?	N	Average	Ecart type	Average standard error
CIVICGLOBAL	1	12	3.0417	.48775	.14080
	2	23	3.2081	.50687	.10569
ESTEEMGLOBAL	1	13	2.9769	.41262	.11444
	2	25	3.2840	.42786	.08557

Table 15: T test for item "Do you feel as though you are really a part of this community?"

		Levene test on the equality of variances		T test for averages						
									Confidence interval of the difference at 95 %	
		F	Sig.	t	ddl	Sig. (bilateral)	Average difference	Standard error difference	Inferior	Superior
CIVICGLOBAL	Assumption of equal variances	.036	.851	-.934	33	,357	-,16641	,17826	-,52908	,19626
	Assumption of unequal variances			-.945	23.205	,354	-,16641	,17606	-,53043	,19761
ESTEEMGLOBAL	Assumption of equal variances	.000	.984	-2.124	36	.041	-.30708	.14459	-,60031	-.01384
	Assumption of unequal variances			-2.149	25.227	.041	-.30708	.14290	-.60124	-.01291

Table 16: Testing independent samples for item "Do you feel as though you are really a part of this community?"

Discussion

This research was intended to determine if there was a connection between previous research that focussed on the Theory of Relative Deprivation and the experiences of people who are blind or have low vision in terms of accessing digital communications. The research questions laid out initially were 1) Does perceived lack of internet accessibility lead to perceptions of unfairness among low-vision or blind individuals? 2) In turn, do perceptions of unfairness negatively impact their level of self-esteem, and civic engagement? These questions looked to determine the links in each variable that was determined to be associated with this concept and appropriate to this context. The key goal of this study was to determine whether the lower levels of access to the internet for blind people and the personal perceptions of them would have a psychosocial impact on those people directly affected by this non-access.

While the initial intent with this research analysis was to not only determine which variables were correlated, but also to determine the direction of causation between significantly correlated variables using the Granger Causality test, the number of participants was too low to determine the direction of causation. Without knowing the direction of causation, it is not possible to determine whether perceptions of access have a direct impact on self-esteem, whether self-esteem impacts perceptions of access or if there is a third variable, that is impacting both self-esteem and perception of access simultaneously.

When examining the link between perceptions of access and perceptions of fairness, there was not a significant correlation. There may be a variety of reasons for this. It is possible that the variables chosen for this study do not mirror well enough the

variables that were shown to be significantly linked in prior research, such as the perception of fairness being used as a variable to test overall relative deprivation based on access. It is also possible that there is an association between the two variables, but that the research did not show this link for this case in part due to the low sample size. Using a smaller subscale of a larger scale to determine the variable of perceived fairness may also have contributed, as there were only four questions to measure the variable compared to broader scales used for each of the other variables tested in this research.

As expected, the association between perception of fairness and levels of self-esteem were confirmed in this research. T tests that were performed on the individual items in the perception of fairness subscale did show that there is a correlation between three of the four items in the subscale and the global value for self-esteem. This was confirmed as predicted. The predicted connection between the perception of fairness and civic engagement, however, was not confirmed. This is possibly due to engagement being directly influenced by self-esteem as suggested in some in prior research (Pellas, 2014) and not connected directly to the perception of fairness. Self-esteem and civic engagement were found to be correlated variables, as expected.

The link between access and self-esteem was also discovered. This was not an expected result based on the initial model proposed. However, it is not surprising considering the challenge presented in the concept of the digital divide. Not having access to the same online resources as your peers can have a negative impact on your well-being and, presumably, your self-esteem. According to Statistics Canada, of those who have seeing conditions and who also use the internet, 46.2% reported that the Internet had increased their ability to connect with people who have similar interests as

them and 60.1% claimed that the Internet had improved their quality of life (Statistics Canada, 2006).

It may be possible that the Theory of Relative Deprivation cannot be applied in this context in the same way that it has been in previous research. The results show a direct link between the variables of perceived lack of access and self-esteem, rather than showing the connection through the variable of perceived unfairness. In the case of online accessibility, which is so central to today's social interactions and workplace success, this direct link may reveal that a person does not need to experience a conscious sense of unfairness in order to feel the impacts on inaccess on one's self-esteem. Simply the fact that they do not have access to online content in the same way as most of the online community could be directly influencing their well-being in this negative way.

While correlations were shown to exist between perceptions of access and self-esteem, self-esteem and perceptions of fairness, and between self-esteem and civic engagement, the missing link between perceptions of access and civic engagement were surprising, given the link between access and self-esteem. A number of reasons may exist to explain this discrepancy. Sample size may have been too low to show a statistically-significant correlation. Alternatively, perhaps the values of civic engagement and intentions to retire (as previously seen to have a correlation with perceptions of access) (Lagacé, Tougas, Laplante, & Neveu, 2010), were possibly not as closely related as hypothesized. An alternate variable that mirrors intentions to retire, but that is more applicable to those of working age may yet yield the expected results in future research.

Given the statistically significant correlations found in this research, the model proposed no longer fits within the dimensions of the results. Considering the connections

that can be made in similar research contexts between the variables, a new model may be proposed to illustrate the findings:

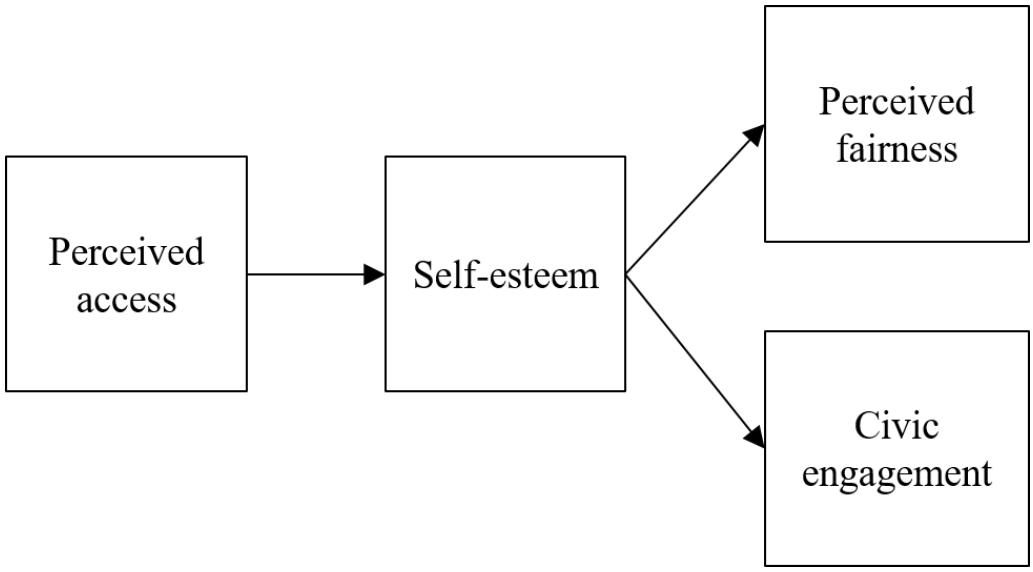


Figure 2: Proposed new model (Perception of accessibility → self- esteem → perception of fairness + civic engagement)

In this new proposed model, higher levels of perceived accessibility could lead to heightened self-esteem, which would then lead to higher levels of perception of fairness and civic engagement.

Future Research and Limitations

While this thesis research did attempt to collect data from as large a sample as possible, as previously noted this was most easily accomplished through the use of self-completed questionnaires. By collecting this data on variables that dealt with the personal feeling and perceptions of the participants in such an objective manner, the nuances of these perceptions could not be assessed in a more in-depth manner. As a result, only the degree to which the variables are correlated was possible to ascertain and not the different personal feelings, negative or positive, were addressed in this research. An accompanying interview may be useful in future research to gather

information that better explores the human impacts of accessibility.

The challenge of collecting this data from such a small sub-set of the population also meant that the call for participation garnered fewer research participants than anticipated. Because of this smaller sample, it is possible that the results that were gathered from this research were not as universally applicable as a larger sample would have been, particularly due to the method of inviting participants – through organizations that may already have contact with the target sample for this survey. Another impact of this small sample size was that, in spite of the wide age range, comparing the results based on smaller sub-ranges was not possible. With a larger sample size, it may be useful to conduct this further refined analysis in order to determine if there are differences within the overall age-range researched.

Given that one of the variables tested was level of civic engagement, targeting those who were already in contact with these types of organizations may have caused the data to result in higher levels of civic engagement than if the participant pool had been selected using other means. In addition, contact was largely made with participants using online methods. Given this research's focus on inaccessibility in an online context, the results may have been skewed based on this sampling method.

Chapter 5:Conclusion

While much of the Canadian and international legislation and even private policies have recently expanded in order to include greater protections for ensuring accessible online content for those with functional impairments that would otherwise limit such access (City of Ottawa, 2012) (Government of Canada, 2014) (Government of Ontario, 2016), enforcement and adherence of and to these laws and policies remain somewhat lax. This thesis research attempted to explore what this inaccessibility meant in terms of perceived human impacts on those who were affected. This research focussed on those who had blindness or low-vision due to previous research that indicated this population likely had greater barriers to access as did others with functional impairments (as well as anyone who is able to access digital content on the internet without any assistive technology) (Vicente & López, 2010).

There is a significant amount of research to be found that focusses on online accessibility. Much of this research emphasises the lack of accessibility and the laws that surround this issue, as well as the impacts that online inaccessibility has on economic, education, and employment factors (Ellcessor, 2010) (Linder, Fontaine-Rainen, & Behling, 2015). While it is naïve to assume that these factors do not play a very important role in the understanding the context of accessibility, they do not delve into the issues that are faced by those without online access in terms of the more human, psychosocial effects. This is important because though there is a measurable negative impact from having lower levels of employment and education, there is also a known negative impact from low self-esteem and low civic engagement.

In an effort to address the issues of the effects of low levels of perceived access on other relevant psychosocial variables, this thesis research used the theoretical framework of relative deprivation to create the setting for the following research questions to be asked:

1. Does perceived of lack of access lead to feelings of unfairness?
2. In turn, do feelings of unfairness negatively impact self-esteem, and civic engagement? (Research questions are summarized in Figure I).

Using a self-report questionnaire delivered either online (using a WCAG 2.0 AAA-level accessible survey service) or in large-print or Braille, as requested, participants answered questions that pertained to their perceptions of access, perceptions of fairness, levels of civic engagement, and self-esteem.

This study, while one of the few that explore the perceptions of those affected by inaccessibility in the online world, did not in any way alter the knowledge about many of the objective impacts of inaccessibility. This research dealt with neither the objective impacts of inaccessibility such as economic effects, nor has it looked into the factors that could snowball in order to produce the effects seen in terms of the correlations between variables. This research found the following: fairness was correlated on three of four scale items with self-esteem levels; the perception of fairness was not correlated with civic engagement; civic engagement and self-esteem were significantly correlated; and perceived access was correlated with levels of self-esteem. While the results have been interpreted to mean that the statistically significant correlations in the variables researched have been due to an impact that they had upon one another, it is also possible that there is an additional variable impacting the correlated variables and causing the

effects seen.

While the proposed model for this research was not linked conclusively with the data collected, a new potential model has emerged from the results of this study that can be used as the basis for further research on the topic. In this new proposed model (see Figure 2), positive levels of accessibility would be expected to lead to heightened self-esteem, which would then lead to higher levels of perception of fairness and civic engagement. Hopefully, it can also provide a much-needed expansion of research into not only the topic of accessibility as a faceless metric, but into the human elements and the real personal implications of internet inaccessibility.

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Appendix A: Questionnaire (English and French)

French

Questionnaire

Âge :

1 re partie – Répondez aux questions suivantes sur une échelle de 1 à 4

(1= complètement en désaccord, 2= en désaccord, 3= d'accord,

4= complètement d'accord)

1. Apprendre à utiliser l'Internet est facile.

1 2 3 4

2. Utiliser l'Internet est clair et compréhensible.

1 2 3 4

3. Il est facile de devenir compétent en utilisation de l'Internet.

1 2 3 4

4. Dans l'ensemble, l'Internet est facile à utiliser.

1 2 3 4

5. L'utilisation d'Internet peut nous rendre productifs.

1 2 3 4

6. L’Internet peut rendre les choses faciles.

1 2 3 4

7. En général, l’Internet est utile.

1 2 3 4

8. Je n’ai pas les moyens pour accéder à Internet pour l’utilisation personnelle.

1 2 3 4

9. Je ne peux pas accéder à Internet pour l’utilisation personnelle.

1 2 3 4

10. J’utilise l’Internet assez souvent à des fins personnelles.

1 2 3 4

11. Je passe beaucoup de temps sur Internet pour des fins personnelles.

1 2 3 4

12. J’utilise l’Internet à des fins personnelles depuis déjà longtemps.

1 2 3 4

2 e partie – Répondez « Oui » ou « Non » aux questions suivantes.

1. En général, peut-on faire confiance à la plupart des gens au sein de cette communauté?

Oui Non

2. En général, est-ce que la majorité des personnes dans cette communauté s'entendent bien?

Oui Non

3. Vous sentez-vous comme faisant vraiment partie de cette communauté?

Oui Non

4. Pensez-vous que la majorité des personnes dans cette commune essaieraient de vous exploiter s'ils en avaient la chance?

Oui Non

3 e partie – Répondez aux questions suivantes sur une échelle de 1 à 4

(1= complètement en désaccord, 2= en désaccord, 3= d'accord,

4= complètement d'accord)

1. Je me sens responsable de ma communauté.

1 2 3 4

2. Je pense que je devrais faire la différence dans ma communauté.

1 2 3 4

3. Je pense que j’ai la responsabilité d’aider les pauvres et les affamés.

1 2 3 4

4. Je suis engagé à aider dans ma communauté.

1 2 3 4

5. Je pense que tous les citoyens ont de la responsabilité envers leur communauté.

1 2 3 4

6. Je pense qu’il est important de s’informer des problèmes touchant la communauté.

1 2 3 4

7. Je pense qu’il est important de faire du bénévolat .

1 2 3 4

8. Je pense qu’il est important de fournir du soutien financier aux organisations de charité.

1 2 3 4

9. Je détiens un poste de bénévole structuré dans ma communauté.

1 2 3 4

10. Lorsque je travaille avec d'autres personnes, je provoque des changements positifs dans

ma communauté.

1 2 3 4

11. J'aide les membres de ma communauté.

1 2 3 4

12. Je reste au courant des évènements dans ma communauté.

1 2 3 4

13. Je participe dans des discussions qui soulèvent des affaires de responsabilité civique.

1 2 3 4

14. Je contribue dans des organisations de charité dans ma communauté.

1 2 3 4

4 e partie – Répondez aux questions suivantes sur une échelle de 1 à 4

(1= complètement en désaccord, 2= en désaccord, 3= d'accord,

4= complètement d'accord)

1. Dans l'ensemble, je suis satisfait de moi-même.

1 2 3 4

2. Parfois, je pense que je ne suis bon à rien.

1 2 3 4

3. Je pense que j’ai plusieurs bonnes qualités.

1 2 3 4

4. Je suis capable de faire les choses aussi bien que la plupart des autres personnes.

1 2 3 4

5. Je sens que je n'ai pas beaucoup de quoi me sentir fier.

1 2 3 4

6. Parfois, je me sens vraiment inutile.

1 2 3 4

7. Je pense que je vaux beaucoup, au moins au même niveau que d’autres personnes.

1 2 3 4

8. Je voudrais bien avoir plus de respect envers moi-même.

1 2 3 4

9. En général, j'ai tendance à penser que je suis un échec.

1 2 3 4

10. Je suis positif envers moi-même.

1 2 3 4

English

Questionnaire

Age:

Part 1 – Answer the following questions on a scale of 1 to 4 (1=totally disagree, 2=disagree, 3=agree, 4=totally agree)

1. Learning to use the internet is easy.

1 2 3 4

2. Using the internet is clear and understandable.

1 2 3 4

3. It is easy to become skillful at using the internet.

1 2 3 4

4. Overall, the internet is easy to use.

1 2 3 4

5. Using the internet can make one productive.

1 2 3 4

6. The internet can make things easier.

1 2 3 4

7. Overall, the internet is useful.

1 2 3 4

8. I do not have the ability to get internet access for personal use.

1 2 3 4

9. I cannot access the internet for personal use.

1 2 3 4

10. I use the internet quite often for personal use.

1 2 3 4

11. I spend a lot of time on the internet for personal use.

1 2 3 4

12. I have been using the internet for personal use for a very long time now.

1 2 3 4

Part 2 – Answer the following questions with "yes" or "no."

1. In general, can the majority of people in this community be trusted?

Yes No

2. Do the majority of people in this community generally get along with each other?

Yes No

3. Do you feel as though you are really a part of this community?

Yes No

4. Do you think that the majority of people in this community would try to take advantage of you if they got the chance?

Yes No

Part 3 – Answer the following questions on a scale of 1 to 4 (1=totally disagree, 2=disagree, 3=agree, 4=totally agree)

1. I feel responsible for my community.

1 2 3 4

2. I believe I should make a difference in my community.

1 2 3 4

3. I believe that I have a responsibility to help the poor and the hungry.

1 2 3 4

4. I am committed to serve in my community.

1 2 3 4

5. I believe that all citizens have a responsibility to their community.

1 2 3 4

6. I believe that it is important to be informed of community issues.

1 2 3 4

7. I believe that it is important to volunteer.

1 2 3 4

8. I believe that it is important to financially support charitable organizations.

1 2 3 4

9. I am involved in structured volunteer position(s) in the community.

1 2 3 4

10. When working with others, I make positive changes in the community.

1 2 3 4

11. I help members of my community.

1 2 3 4

12. I stay informed of events in my community.

1 2 3 4

13. I participate in discussions that raise issues of social responsibility.

1 2 3 4

14. I contribute to charitable organizations within the community.

1 2 3 4

Part 4 – Answer the following questions on a scale of 1 to 4 (1=totally disagree, 2=disagree, 3=agree, 4=totally agree).

1. On the whole, I am satisfied with myself.

1 2 3 4

2. At times, I think I am no good at all.

1 2 3 4

3. I feel that I have a number of good qualities.

1 2 3 4

4. I am able to do things as well as most other people.

1 2 3 4

5. I feel I do not have much to be proud of.

1 2 3 4

6. I certainly feel useless at times.

1 2 3 4

7. I feel that I'm a person of worth, at least on an equal plane with others.

1 2 3 4

8. I wish I could have more respect for myself.

1 2 3 4

9. All in all, I am inclined to feel that I am a failure.

1 2 3 4

10. I take a positive attitude toward myself.

1 2 3 4

Appendix B: Survey invitation (English and French)

French

Invitation à participer à une étude sur l'impact des communications en ligne non accessibles

Madame, Monsieur,

Je suis une chercheuse au programme de maitrise en communication de l'Université d'Ottawa. Je m'apprête à commencer une nouvelle étude auprès des canadiens âgés de 21 à 60 ans atteints d'une déficience visuelle pouvant avoir un impact sur l'utilisation des communications en ligne.
Puisque nous vivons dans une société axée sur les technologies, il est essentiel que nous travaillions vers l'accessibilité en ligne, afin que tous les membres d'une société donnée puissent accéder aux mêmes contenus.

Si vous avez entre 21 et 60 ans et que vous êtes atteint d'une déficience visuelle ayant un impact sur votre capacité à accéder aux contenus en ligne, votre participation à cette étude sera la bienvenue! Votre participation consistera à remplir un sondage électronique accessible (une copie papier en gros caractères ou en braille est aussi disponible) ce qui vous prendra environ 40 minutes. L'étude sera réalisée de façon complètement anonyme. Seulement les chercheuses auront accès aux données du sondage et aucune

information pouvant identifier les participants ne sera demandée. L'étude est menée par une étudiante de l'Université d'Ottawa et est indépendante de toute autre organisation.

Pour participer à cette étude, vous pouvez tout simplement cliquer sur le lien suivant :

http://fluidsurveys.com/surveys/herin8/perceptions-of-internet-access-and-impacts/langfr-ca/

Ce lien vous donnera l'accès au formulaire de consentement ainsi qu'au sondage en ligne accessible. Si vous préférez remplir le questionnaire en format papier en gros caractères ou en braille, veuillez me l'indiquer par courriel à l'adresse suivante : xxxxxxxx@uottawa.ca.

Si vous avez des questions concernant cette étude, n'hésitez pas à communiquer avec moi.

Cordialement,

Heather Dyke, chercheuse principale
Département de communication, Université d'Ottawa Courriel : xxxxxxxx@uottawa.ca

English

"Invitation to take part in a study about the impacts of non-accessible online communications"

Dear Sir or Madam,

I am a researcher from the University of Ottawa Master of Communications program. I will soon be starting a new study among Canadian between the ages of 21-60 with low vision or blindness impacting the use of online communications. As this is a technology-driven society, it is important that we work towards accessibility online, allowing all members of society access to the same content.

If you are between the ages of 21 and 60 and your low vision or blindness impacts your ability to access content online, your participation in this study is welcome! Your participation in this study would consist of completing an accessible electronic survey (a large-print or braille paper copy of the survey is also available) which would take approximately 40 minutes. This study will be done completely anonymously. Only the researchers will have access to the completed surveys and no identifying information will be included. This research is being conducted by a student researcher from the University of Ottawa and is independent of any other

organization.

To take part in the study, you can simply click on the following link: http://fluidsurveys.com/surveys/herin8/perceptions-of-internet-access-and-impacts/.

This link will give you access to the consent form as well as to the accessible online survey.

If you prefer a paper copy of the questionnaire in large print or Braille, please send me an email at: xxxxxxxx@uottawa.ca.

If you have any questions about this study, please do not hesitate to contact me.

Sincerely,

Heather Dyke, Principal Investigator

Department of Communication, University of Ottawa

Email: xxxxxxxx@uottawa.ca