**The Gender Divide and Internet Access in Canada:
A Critical Analysis of Concepts, Policies, and
Measurements**

by

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Abstract

This thesis examines how ambiguous definitions of Internet access in documents published by the Government of Canada have led to weak federal access policies, as well as inadequate survey design and subsequent discussion from Statistics Canada. Specifically, this thesis focuses on the dearth of analysis of a gender divide with respect to Internet access in Canada. Crosstab and logistic regression analyses are performed on publicly available Statistics Canada datasets to determine if there is a difference in the way men and women use the Internet. These analyses reveal that men are more likely than women to access the Internet from home on a daily basis. The results are similar across other points of access including work and school, and remain consistent in a five year time series analysis. The official claim that the gender gap is either closing or nonexistent is therefore unsupported.

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Chapter 1

Introduction

The purpose of this thesis is to consider the issue of Internet access and digital divides in Canada. Clearly, there has been an inordinate amount of literature generated on this topic over the past ten years, with the arguments ranging across a broad spectrum—from those who argue that a digital divide with respect to Internet access is nothing to be concerned about, to those who believe it threatens the very fabric of society as we know it. Given the vast amount already written about this topic, one can legitimately question the point of adding yet another chapter to the debate.

This thesis will deal specifically with how Internet access and the digital divide in Canada are defined and framed, using documents published through the federal government and subsequent policy initiatives, and the statistical analysis conducted and published by Statistics Canada. These documents and policies can be considered the foundation documents of Internet access policies in Canada. This thesis will also focus on

the lack of official discussion regarding a gender divide in Internet access in Canada. Finally, this thesis will present detailed statistical analysis conducted by this author demonstrating that a gender divide does exist with respect to Internet access in Canada, specifically when considering daily in-home access. The analyses and discussions presented in this thesis will argue that ambiguous access definitions permit the use of ambiguous statistical measurements, and lead to weak access policies.

Kevin McSorley (2003) notes that there is what he terms “discursive ambiguity” with respect to the definitions of access and digital divides. He argues there should be more attention paid to “how this potential discursive ambiguity is managed within the specific policy discourses, communities of interest and contexts of policy deliberations, in which the will to define the digital divide is exercised” (p. 76). Specifically, he believes there is not enough work addressing how “a hegemonic conception is established [...], through what narrative frameworks the digital divide is ultimately articulated and serves to renew, and how this foregrounds and obscures the various competing visions and delimits the parameters of policy intervention” (p. 77). It is hoped that this thesis will provide a good foundation for understanding the ambiguity in Canada with respect to defining access and the Information Highway.

This thesis is broken into three major chapters. The first is a discussion of the background documents published between 1995 and 2000 under the overall jurisdiction of the federal government. The discussion will also include responses published from the critical analysis/public interest perspective. The first chapter concludes that the discussions published in the federal foundation documents use a very broad concept of Internet access. This is problematic because, in creating broad and weak access

parameters, we see a neglect of specific access issues such as the gender divide, and a corresponding lack of public policies designed to reduce specific divides. Moreover, there was significant input from public interest advocates, specifically discussing issues such as income and gender as possible sites of disparity regarding Internet access. However, their comments were rarely incorporated into the official discussion and subsequent publications produced by the federal government.

The second chapter of this thesis provides a detailed examination and analysis of framing issues in Statistics Canada survey designs, data analysis, and associated discussion reports. The chapter will touch on several issues, including the lack of consistency with respect to a definition of a typical Internet user, the lack of analysis regarding a gender divide, and the significant emphasis on e-commerce activities in Canada. The discussion draws in part from a comparison of reports published by Statistics Canada, reports published by private researchers using privately collected data, and a personal interview with the Chief of Information Society Research and Analysis Science, Dr. George Sciadas. Incorporated throughout the chapter are basic data analyses performed by this author using the publicly available Statistics Canada microdatasets. The data analyses are used to discuss the existence of a gender gap in the context of the Statistics Canada reports.

The third and final chapter of this thesis is focussed exclusively on detailed data analysis performed by this author. These analyses have not been conducted by Statistics Canada, and clearly reveal a statistically significant relationship between gender and Internet access in Canada, specifically daily in-home Internet use in Canada. The results demonstrate that income, age, and education are among the strongest predictors of Internet

access, but gender, in and of itself, can be used as a reliable predictor that men are approximately 50% more likely to access the Internet on a daily basis from home than women.

Drawing again from McSorley's notion of "discursive ambiguity", the concluding remarks of this thesis will suggest that, based on preliminary research, it is possible to observe the ambiguous concepts of access and emphasis on e-commerce as articulated by Statistics Canada repeated in national media outlets, specifically, the Globe and Mail.

Chapter 2

Defining Access

2.1 Introduction

ac-cess (*ak-*ses also ik-*ses)

2a: permission, liberty, or ability to enter, approach, or pass to and from a place or to approach or communicate with a person or thing **b:** freedom or ability to obtain or make use of something **c:** a way or means of access **d:** the act or an instance of accessing. (Merriam-Webster's 11th Collegiate Dictionary, 2003).

This chapter falls under the framework of what Ian Hacking (1999) refers to as a primary use of social construction—to critique the status quo (p. 6). He notes that classic social construction analyses tend to start from the notion that *X* (in this case, the digital divide), is not inevitable, that *X* is not good, and that society would be better off if *X* were altered (p. 7). However, it is important to note that while Hacking suggests traditional social construction is usually done to critique the status quo, McSorely (2003) notes that a

similar framework is often used by the dominant policy communities to justify the status quo, in this case, weak universal access policies. He argues that:

Discussions about what are appropriate social policies to address issues such as inequality now largely take place through a definitional debate, what a 'problem' such as the digital divide really is, how it can be measured and hence, how it may be 'tackled' or even bridged. In such extremely widespread formulations, there is a certain nominalization, the digital divide is an already existing phenomenon and is to be tackled, closed, or bridged, but *not* prevented. (p. 76).

Kenneth Hacker and Shana Mason (2003), drawing from Bourdieu, suggest that this type of language represents an effort to encourage traditionally disadvantaged groups to believe that social hierarchies are natural and inevitable, thus legitimizing social inequities in the information communication technology framework (p. 109). An example of this process can be seen in Benjamin Compaine's (2001) assertion that the digital divide is no longer something to be concerned about—that efforts have been made to bridge it and those households that remain excluded are merely by-products of the democratic capitalist system (p. 333).

This analysis will begin with a review of programs and documents outlining Canada's access policies issued from the Government of Canada. These can be said to represent the normalized status quo (X). It will continue with a review of arguments suggesting that there are serious problems with the existing policies, and summarize suggestions that have been made to resolve and transform them. However, it quickly becomes apparent that Internet access and the digital divide are not as easily summarized as in the Merriam-Webster dictionary. Among the critiques, there are conflicting interpretations of how to define Internet access and what constitutes a digital divide.

Although Hacking warns that it is important not to become complacent and focus myopically on one small part of the overall picture (p. 36), it is useful to have a focal point to lead into the data and content analyses in upcoming chapters. Along with general observations regarding the digital divide and Internet access, this review will specifically highlight points made about the gender divide. There is some debate regarding the gender divide, with several authors suggesting that the gap between the level of access men and women have to the Internet appears to have narrowed in recent years. However, it has also been noted that while basic connection levels may have equalized, there remains a huge gap in how, and more specifically, how frequently, men and women use the Internet.

2.2 Access in Canada

Before reviewing the various reports and program outlines published by the Government of Canada, it is useful for our purposes to consider the arguments made by Kvasny and Truex (2001). They suggest that “institutions actively (re)produce and legitimize popular representations of technology and its role in the new economy” (p. 2). Although specifically referring to U.S. Government policies, their assertion that those policies, and policy documents, “take on a nurturing tone that helps to ensure the complicity of the audience members” (p. 13) can help in my analysis.

They suggest that the true motives for creating access programs in the U.S. is to re-categorize those lacking access to digital communications as new markets for technology firms and as sources of additional votes for politicians looking to score political points. Furthermore, they suggest that “these calls for social inclusion ignore the fact that

structural forces beyond physical access to technology may act to perpetuate the divide” (p. 13).

Similar arguments are presented by Moss (2002). Although he is specifically referring to an international digital divide, he suggests that companies such as AOL indicate a desire to help abolish the digital divide not because of any altruistic ideology, but because it would be sound business practice in an effort to generate more customers (p. 164). He argues that this can be viewed as a type of “need formation”:

It concerns how the needs of both societies or individuals are both determined by an external agent, reducing the agents self-determination. This might be the result of a campaign by an external agent or through a type of false consciousness (Ibid). Obviously it is important for companies to seek new revenue sources in order to maintain economic viability. The issue is that their revenue seeking efforts are presented as selfless actions, when that is not necessarily the case.

The comments made by Kvansy & Truex and Moss echo the arguments made by several authors critiquing Canadian Internet access policy process. So, while we are trying to keep Hacking in mind and give recognition to a wide range of perspectives in this analysis, this chapter will also highlight sections of Government policies and programs that suggest customer production for Internet providers is one of the true motives for connecting Canada. Specifically, the Information Highway Advisory Council (IHAC) reports, in particular the second report from 1997, provide a crystal clear example of this framing.

Briefly, the policy process with respect to Internet access in Canada officially began in 1994 with the formation, at the behest of the federal government, of the Information Highway Advisory Council (IHAC). The Council put out two comprehensive reports, the first in 1995 followed by a second in 1997. The second report also provided a

milestone indicator to review goals set in the first report. In 1995, in conjunction with the first IHAC report process, the CRTC issued a report discussing telecommunications convergence in Canada. In response to both reports, the federal government presented a Federal Access Strategy in 1996. Following all the reports, the Government implemented the Connecting Canadians program, consisting, in part, of the Community Access Program, the National Satellite Initiative, and the Rural and Northern Development Program. These initiatives were initially designed to address possible issues with respect to the digital divide between urban and rural communities. Eventually, the programs were broadened to address the divide between Canadians able to afford in-home Internet service and those who could not.

The following sections will draw from these reports and programs to demonstrate the initial shift towards producing weak concepts of access and subsequently weak policy initiatives, thereby setting the frame for the detailed examination in the following chapters of weak measurements of access by Statistics Canada. These reports represent a comprehensive overview of the Internet access policy process in Canada. While there remain various speeches and pronouncements from the federal government, particularly Speeches from the Throne, the following discussion also includes an analysis of pronouncements made by the Prime Minister and various Ministers posted on the Connecting Canadians website. Those pronouncement are consistent with what was proposed in various Speeches from the Throne, and provide a reasonable sample of public announcements made by the federal government.

2.3 The Information Highway Advisory Council: Call for

Submissions

In 1994, the Information Highway Advisory Council was created to help the federal government design and implement strategies for the Information Highway (IHAC, 1995a). However, as noted by Clement et al. (2001), it was immediately apparent that this Council differed significantly from previous Royal Commissions and task forces. There were no public consultations or hearings scheduled, although written comments were invited (p. 27). Furthermore, the composition of the Council raised serious questions, given that it was “dominated by representatives of the primary stakeholders in the broadcasting, cable and telecom industries” (p. 27).

A review of the 24 member Council reveals that only eight members did not represent the telecom industry. Moreover, the industry members were generally presidents, CEO's, and vice-presidents of major Canadian telecommunications companies (i.e., Bell Canada, Newbridge Networks Corporation, Rogers Cantel, and Bell-Northern Research Ltd.), while the non-industry members were primarily university professors, and labour representatives, and included one member who identified himself as an author and composer (IHAC, 1995b, p. 199).

Prior to releasing their first report in September 1995, the Council had issued a backgrounder document requesting written comments from the public. However, it appears that several points had already been agreed upon, even before any public input was received. The Council articulated their three main policy issues:

Access: What kinds of physical access connections to the networks and content will we need to ensure that all Canadians have the opportunity to exploit the economic, social and cultural benefits of the Information Highway? How do we ensure that there is viable and sustainable competition offering access and universal and affordable services to Canadian households? How do we provide open and equitable access to all service and content providers while still securing a prominent place in the new system for Canadian content and service providers? How do we ensure that Canadians with special needs as well as Canadians in rural in remote communities have access to Information Highway services?

Affordability: How do we ensure that all Canadians can afford to use the Information Highway?

Universal Service: What kinds of information and services should be available to every Canadian? How should our definition of essential services evolve over time to reflect changing needs and service options made possible by new technologies? And how should we pay for these services? (IHAC, 1995a, p. 4).

Although the Council had set these three policy objectives, it appears there was little expectation of setting actual definitions for access and universal service. When discussing the issue of affordability, they note that while “affordable telecommunications and broadcast services are federal policy objectives, [...] affordability is not defined in legislation [and] inevitably, it is a relative concept” (p. 12). They also suggested that “the definition of ‘universal service’ will continue to change and expand” (p.16).

While reconciling themselves to the fact that concrete definitions about access and affordability would be vague rather prematurely, the Council did seem quite confident about who would be creating the necessary infrastructure, asserting that “government should foster an environment that encourages innovation and a greater reliance on market forces” (p. 19). They also seemed prepared to give industry an easy out with respect to overly costly infrastructure, claiming “there are situations, where market forces will be

insufficient, or will work too slowly, to meet public interest [...]. Extending service to remote areas may be an example of this” (p. 19).

Finally, given the emphasis on access, it is ironic that the Council obscured the limited access the public had to the Council. They state:

The public’s role—as individuals, organizations or public interest groups—is to inform the government and suppliers of their needs as they perceive them. There are bound to be differences of opinion; that is inevitable, and even desirable (p. 19).

However, they made little effort to actually solicit public input, and did not generally incorporate the public suggestions into the final reports.

IHAC’s call for submissions provides an initial glimpse of the general concerns that emerged over the years as Canadian Internet access policies were created. Although their stated goals of examining access, affordability and universal service seem clearly defined, the fact that they had already determined that an open marketplace was the chosen route to achieve these goals, and their admission that they were seeking fluid definitions of access, reveal the preliminary foundations of ambiguous concepts of access.

2.4 CRTC: 1995

In May 1995, the CRTC released *Competition and Culture on Canada’s Information Highway: Managing the Realities of Transition* (CRTC, 1995). The CRTC was asked to report to the Government on “the development of content and competition policies for new communications technologies and services that will comprise the ‘Information Highway’” (CRTC, 1995, p. 4). It was in the CRTC’s mandate to provide a report that would complement the work being done by IHAC at the same time. This report

provided a glimpse of what was to come in the IHAC report to be released a few months later.

Like IHAC, the CRTC had a drastically reduced public participation policy for this report. Written submissions were requested in a two-step process and one public hearing was held in Ottawa to permit the authors of the written submissions to elaborate on their comments (p. 4). However, despite the lack of public hearings across the country, Clement et. al (2001) note that the CRTC received a wide range of written submissions, including several from public interest groups recently mobilized around the IHAC call for submissions (p. 29).

The CRTC did acknowledge that some of the comments they received expressed reservations regarding the “ability of a purely competitive model to ensure affordable and universal access by individuals, both to essential communications services and to new emerging services associated with the Information Highway” (p. 5). Eventually, the authors of the report asserted that market forces alone would not be enough to ensure an even distribution of universal service across the country, and suggested that “the goal of universal access to [that] highway will be realized through various means, including market forces, subsidies and cooperation” (p. 34).

This assumption is reinforced throughout the report. Generally, it was thought that market forces would take care of everything except for distribution of services to rural and remote areas (p. 35). There was no recognition that there is a huge diversity of access issues even within areas traditionally considered desirable for service and support by “market forces”. For instance, there was little to no acknowledgement of income issues with respect to Internet access, nor, for the purposes of this analysis, was there any

discussion of possible gender issues. From the perspective of examining definitions of access, this report followed the same pattern begun by the IHAC call for submission, and subsequently observed in the IHAC reports themselves and the Federal Access Strategy. The concept of access is left broadly defined, with little discussion of specific access considerations, thus permitting subsequent policy initiatives to downplay any need to create specific policies for specific access divides.

The CRTC did posit that community access points would be a solution for some of the problems associated with access, but did not suggest who should maintain the community access centers, other than to assert that their existence should be part of the government strategy (p. 34). This implies that the CRTC did not see in-home access as a priority, and considered community access centers acceptable for meeting the requirements for universal access. Moreover, given the emphasis on allowing market forces to dictate how the Information Highway should be rolled out across the country throughout the report, the fact that responsibility for community access centers is left unassigned, although perhaps implied as a government mandate, relieves telecommunications companies from the task of providing less profitable services, and permits them to focus on providing more profitable in-home access to households that can afford it.

The IHAC call for submissions and the CRTC report both articulate the need to allow "market forces" to determine where telecommunications companies should provide services, with the government stepping in to address the problem where the expense is too great for the private companies to undertake. Again, this reveals the foundations of weak concepts, and policies, of access. The term market forces is never clearly defined, leaving

the private telecommunications companies to decide where they would like to provide infrastructure for access, essentially leaving undesirable areas for the government to deal with. Moreover, as will be discussed further in this chapter, the issue of what kind of access should be provided is also left open-ended, and up to private industry to determine. However, the emphasis in these reports is with respect to an urban/rural divide, with the expectation being that private telecommunications companies will have trouble connecting the more rural and remote communities across Canada. The emphasis on geographically remote areas obscures the fact that there are several areas within large population centers that to this day still are unable to have in-home high-speed Internet access. Furthermore, while both reports recognize the problem of an urban/rural divide with respect to access, there is the continued neglect of any other divides (income, age, education, gender). At the time these reports were published, Statistics Canada had begun producing basic data measuring in-home Internet access using the Household Income and Facilities Expenditures (HIFE) surveys.

2.5 Information Highway Advisory Council: First Report

In September 1995, IHAC released their first report, entitled *Connection Community Content: The Challenge of the Information Highway* (IHAC, 1995b). Like the CRTC before it, IHAC's first substantive statement asserts that "Canada's success on the Information Highway depends on whether we can establish a competitive framework that unleashes creativity, innovation, and growth" (p. x).

The authors of the report proceeded to argue that the Information Highway would only succeed if it were permitted to develop within the framework of an essentially

unregulated marketplace. The “vital” role of the government would be to dismantle any regulatory barriers that may impede the development of a competitive environment. Furthermore, “the private sector should build and operate the Information Highway [and] those who make the investments should bear the risks and reap a fair reward” (p. x). This implies that the ambiguous definitions observed in the CRTC report regarding where telecommunications companies should be required to provide service was deliberate, in anticipation of IHAC’s policy directive that private industry should decide where and how to operate the Internet infrastructure.

There was an attempt made, as in the CRTC report, to acknowledge that leaving the complete implementation of the infrastructure of the Information Highway to the private sector could result in uneven distribution and access, but once again, it was primarily geographic access issues that were addressed. The authors claimed that “market forces occasionally fail to provide universal access at affordable prices. This may be the case in high-cost-of service areas such as rural and remote communities or in the provision of services for Canadians with special needs, such as the disabled” (p. xiii). However, this comment, like reports before it, again fails to address any possibility that there may be other divisions with respect to universal access such as the ones considered in this thesis. Furthermore, like the CRTC report, it sets up the reader for the assumption that the private sector should not be expected to provide service to remote and rural areas.

Throughout this and subsequent reports, it was consistently emphasized that the private sector should be responsible for the infrastructure roll-out, should reap financial benefits of doing so, and should not be expected to take on the so-called burden of providing access to those areas and individuals that might require extra financial outlay on

their part. Moreover, when a clear policy objective is outlined for the government, with specific instructions, it entails providing tax credits to private companies for Research and Development (R&D). As will be discussed later on, such generosity with tax credits was not initially extended to the community based networks.

In an effort to highlight the benefits of the Information Highway for Canadians, and perhaps to divert attention from the huge responsibilities being handed over the private industry, the prospect of employment and job creation is discussed throughout the report. However, this benefit is contingent on government acquiescence with respect to regulation. The authors claimed that “if Canada minimizes regulation, creates a robust environment for R&D and seizes opportunities in building specific applications that serve Canadian purposes its efforts will be repaid through the creation of new businesses, products, services and jobs” (p. xviii). Further on, in the full report, the Council claims that a sound Information Highway will “strengthen Canada’s information industries sector and others throughout the economy and create a self-reinforcing cycle of innovation, growth and jobs, and provide for a better government” (p. 12).

In response to these claims, a dissenting minority report was issued by Council member Jean-Claude Parrot, Executive Vice-President, Canadian Labour Congress. He argues that years of privatization, deregulation, and cuts to public services have led to “increasing gaps between rich and poor, more poverty, more insecurity, and at the root, an unrelenting employment crisis” (IHAC, 1995b, p. 216).

The Council’s discussion regarding the employment benefits of the Information Highway are relevant to a discussion about access because they effectively obscure non-geographic access issues. Although the concept of a digital divide is discussed in the

report, it is presented as a lesser concern, outweighed in part by the potential employment benefits of an unregulated marketplace.

When the Council specifically addresses access, there are some positive comments to be found. They assert that:

The Information Highway should be at least as accessible, affordable and relevant to Canadians as telephone and television services are today. Wherever the marketplace creates inequities of access for Canadians, or barriers to access to Canadian content, problems must be addressed through public/private sector collaboration and, where necessary, government intervention (p. xix).

The fact that the Council believed that the Information Highway should be as accessible as telephones or television could be taken as a suggestion that in-home access would be considered as the standard for universal access, and that divide concerns should not be restricted to the urban/rural issue.

However, an actual claim for in-home access is never articulated and, given the later emphasis on the benefits of community access points, it seems unlikely that universal in-home access was ever the goal of the Council. Eventually, the Council conceded that it was unlikely that public policy could provide individual connections for everyone, and suggested that the government develop and support pilot projects that would encourage people to use libraries as public access points. This is problematic because they assert that “public access points should be as commonplace as public telephones, postal outlets and automated bank machines” (p. 46). However, libraries are among the first public services to be cut in municipal budgets. The most recent budget proposals for the City of Ottawa initially recommended the closure of three library branches and a harmonization of library hours across the City to the lowest standard (City of Ottawa, 2004). Although Council

eventually decided not to close the three branches, the hours will be harmonized across the City, with most branches seeing a decrease in their service.

With respect to an actual definition of what services should be included in a universal access package, the Council was vague. They claim that market surveys are not valuable as measuring tools when considering what will be a useful basic service in the future. As such:

Public policy should rely primarily upon competitive market forces to ensure the universal access to the Information Highway services and products at affordable prices. Government intervention should occur only where market forces demonstrably fail to safeguard this policy (p. 171).

Furthermore, the Council recommends that if non-market mechanisms are deemed necessary to facilitate the implementation of universal service, the government or CRTC should “through a public consultation process, ensure that such mechanisms are explicit, transparent and competitively neutral” (p. 171). However, the Council did not recommend that private industry provide any such transparency in its determination of what should or should not constitute universal service. Moreover, it is reasonable to question how public or transparent any government or CRTC consultation would be, given the significantly reduced public consultation procedures for both the IHAC reports and the 1995 CRTC report.

To complicate matters further, the Council suggested that “where differences in opportunity are identified, the federal government with other stakeholders should develop an appropriate response to deal with these differences” (p. 177). So even if the government does step in, the Council did not recommend any action without consulting with private industry. Furthermore, the government usually relies upon data collected by

Statistics Canada and other private polling firms to identify any “differences in opportunity” and such data can be presented in such a manner as to mute or obscure any observed differences of opportunity. If there are no differences officially identified, then no action need be taken. However, of even greater concern is that we are again witnessing weak concepts of access leading to weak policies. Essentially, IHAC is generically asserting that if “something” goes wrong, “something” should be done. Moreover, there is once again no responsibility allocated for determining where differences of access are occurring. It is unclear whether the federal government is supposed to identify deficiencies, or if the private telecommunications companies inform the government that there are issues that need to be addressed but that are beyond their financial mandate. One thing is certain, however: given the continued emphasis solely on a broad geographic urban/rural divide, this report does not encourage significant exploration of other divides.

As mentioned earlier, there was little attempt made on the part of the Council to acknowledge any potential inequalities of access other than geographic. There was the appearance of some concern regarding a potential gender divide with respect to access. The Council recognized that “gender and social barriers need to be removed” (p. 176) in order to permit everyone to participate and benefit from the opportunities presented by the Information Highway. However, the Council focused on issues of safety, privacy, and security on the Internet as barriers to women’s participation, neglecting to mention other issues such as income and differences in the nature of how men and women use the Internet.

The Council did suggest that the government, through Industry Canada, HRDC, and Statistics Canada conduct research to “identify how gender, age, and other social

factors create differences in participation in the Information Highway” (p. 176). Such research has been undertaken in part. As will be discussed in detail next chapter, Statistics Canada has conducted the Household Internet Use Survey (HIUS) annually since 1997. However, as the title indicates, the survey covers households, not individuals. Given that the Council recommended government intervention only where “differences of opportunity” are identified (as mentioned above), the problem is that such individual differences are easily obscured under the aegis of a household survey.

2.6 Federal Access Strategy: 1996

In 1996, the Government released *Building the Information Society: Moving Canada into the 21st Century* (Government of Canada, 1996). This was the Government’s response to the 1995 IHAC report. The authors began by reassuring Canadians that they have “prepared an action plan designed to ensure that Canadians have the Information Highway they need and want—not something imposed upon them” (p. 1). However, much of the information contained in this report echoed the recommendations from the IHAC report, starting with the claim that “the private sector should undertake the necessary investment in infrastructure, bearing the risks and reaping the associated rewards—to the benefit of all Canadians” (p. 5).

Given that the IHAC report also asserted that the private sector should be permitted to determine where to invest in infrastructure, but recognized that it was likely that there would inevitably be underserved areas, it is difficult to reconcile the assertion that there will be a benefit to all Canadians by leaving all decisions up to private industry. The authors did assert that all Canadians should have affordable access, regardless of

where they live (p. 2), suggesting that the Information Highway should be as accessible and prevalent as telephones and televisions. They further claimed that “the growing market for information products and services should work to ensure affordable access to essential Information Highway services in a competitive environment” (p. 23). However, once again, there was the caveat that “where market forces fail to provide this level of access, the government is prepared to step in to ensure access to essential Information Highway services for all Canadians, regardless of their income or geographic location” (p. 23). This is an interesting comment in that it digresses from the strictly geographic emphasis of similar comments made in the IHAC report. It does not restrict geographic concerns to simply an urban/rural divide. But again, it must be reiterated that the any policy action is left to the ambiguous whim of “market forces”.

In the first concrete access policy initiative, the Canadian Access Program (CAP) was proposed as a prototype (this program will be discussed in Section 2.8). The authors of this report noted that up to \$30,000 is provided to CAP recipients for equipment, connections, technical support and training. However, according to the *Community Access Program (CAP) Information Package: Financial Claims, Advances and Reports For Urban CAP Recipients* (Industry Canada, 2001), “the recipient’s matching costs must be equal to or greater than the Industry Canada contribution to meet the terms of the contribution agreement” (p.2). The matching funding must come from partnerships with private corporations. The government’s pledge to step in to ensure affordable access rings hollow given that CAP funding is fully contingent on matching funds being provided by the community group. Moreover, there is no corresponding requirement made of

telecommunications companies to provide any new infrastructure to successful remote area CAP applicants.

The government's access strategy also includes specific tax credits for R&D. According to the authors of the report, \$1 billion in indirect assistance would be provided through the Scientific Research and Experimental Development tax credit (Government of Canada, 1996, p. 8). However, this type of assistance also calls into question the true commitment of the government to full access and community networks. Several community access networks, like the Calgary Community Network Association (CCNA), the Vancouver Community Network (VCN), and the National Capital Freenet (NCF), were initially denied charitable status, which would have permitted them to issue tax receipts for any donations received. Eventually, a court challenge by the VCN was successful, with the judgement decreeing that "the free exchange of information among members of society has long been recognized as a public good" (VCN, 2004a). As a result, community networks can now create their by-laws and constitutions to meet the mandates of a charitable organization and issue tax receipts (Keenan & Trotter, 1999; VCN, 2004; VCN, 2004a).

The issue of taxcredits provides insight into the problems of creating ambiguous guidelines with respect to federal government responsibilities regarding Internet access. It has been stated and restated in reports that the government would step in where required to fill in where private corporations determined they could not. However, the decision to deny community networks taxcredits, to the point that a court challenge was required, calls into question the government's reliability to pick up where private industry fails to provide. Furthermore, the Federal Access Strategy calls for \$1 billion in tax credits. As of

2004, the CAP program had funded 8, 800 sites, and intends to provide funding for up to 10,000 sites (www.connect.gc.ca). If all proposed CAP funding is disbursed, the total funding is \$300 million, falling far short of the \$1 billion allocated for private industry. Granted, the \$1 billion is in the form of tax credits, thus relieving the government of directly providing the funds to private industry for R&D, but even a portion of those funds in public coffers could have been used to facilitate Internet access for Canadian citizens.

The government's access strategy included brief mention of a potential divide between men and women with respect to access to the Information Highway, mandating that gender-based analysis (GBA) of policies dealing with the Information Highway be undertaken where appropriate. However, there is currently no defined set of parameters outlined to assist federal departments in determining whether GBA is warranted (Government of Canada, 1996, p. 16). It is useful at this point to provide a brief definition of Gender Based Analysis. Introduced in 1996 as a component of the Liberal government's report *Setting the Stage for the Next Century: The Federal Plan for Gender Equality*, GBA "requires federal departments and agencies to incorporate a gender perspective into policies and programs within their operational spheres" (Grace, 1997, p. 583). The program is spearheaded by Status of Women Canada (SWC); however, there is no funding for departments to conduct it, and SWC has limited organizational capacity to lead the implementation, relying mostly on persuasion and negotiation with various departments. Some of the departments that have participated in policy orientation sessions organized by SWC include the Solicitor General, Health Canada, Statistics Canada and HRDC. However, there is no official requirement for these Departments to actually implement GBA.

Familiar terminology is employed by the government as they “count on individual departments and agencies to assume responsibility to implement gender-based analysis ‘where appropriate’” (p. 593). Grace also notes that a decentralized style of implementation can result in multiple frameworks being used across different policy-making communities, leading to the overall legitimacy of the program being questioned (p. 594). She concludes that conceptual and organizational constraints on GBA will render it “unable to attend to the specifics of women’s realities or to their structural discrimination as a social collective” (p. 595). Therefore, the government’s assurances that potential gender inequities were being taken seriously enough to warrant a policy recommendation in the Federal Access Strategy, and in IHAC’s reports, was not a new policy direction, but instead, a restatement of an existing policy, one that has little weight behind it. One might argue that a decentralized style of GBA implementation will lead to innovation within individual federal departments. Even were this to be true, before innovating policies can emerge from GBA, it must be first implemented, and there has been resistance within several federal departments to even consider incorporating GBA into their policy cycle.

The government’s own access strategy is vague when it comes to actually defining access. Like the IHAC report before it, the report claimed that access should be universal, affordable and equitable, that there should be consumer choice and diversity of information, that there was a need to ensure citizens’ participation, and that there should be open and interactive networks (p. 24). But there was no attempt made to define essential services. In fact, the question is left open-ended: “A fundamental question to be addressed will be the definition and delivery of essential services on the Information

Highway” (p. 24). It does seem clear that the government was attempting to reinforce the notion of public access sites rather than actual in-home access as an acceptable alternative, suggesting that “measures to permit use of the Information Highway by people without private means to do so [...will] likely require the establishment of public access points in libraries, community centers, schools, shopping malls and other public buildings” (p. 24). To be fair, this is a broader list than was presented in the first IHAC report. Realistically however, libraries remain the main point of community access.

2.7 Information Highway Advisory Council: Second Report

In September 1997, IHAC issued its second and final report, entitled *Preparing Canada for a Digital World: Final Report of the Information Highway Advisory Council* (IHAC, 1997). Much of the report essentially uses the same tone as the 1995 report, with some changes. The first recommendation in this new report was to push for a greater role for Statistics Canada than originally outlined in the first report (p. 5). This implies that the members of IHAC recognized that there were some problems with the distribution and use of the Information Highway across Canada, and that existing statistical measures were not providing clear information.

The authors created a specific plan of action, requesting that the CRTC and Statistics Canada “monitor the way in which the market for Internet access develops, especially among people with low incomes, disabilities or living in geographically remote areas, and should take steps to correct access problems that emerge” (p. 47). This was the first clear acknowledgment that lack of access is not necessarily just a geographic issue. However, the Council downplayed any overall concerns, asserting that:

The evidence indicates, however, that certain groups have been slower to take up these new technologies and services—low-income households, people in rural and remote areas, and others. Further analysis will also be needed to determine how gender, age and other social factors create differences in Internet access and use. Because it is difficult to predict future levels of penetration for these groups, the Council cannot determine with absolute certainty whether there will be an access problem. For example, satellite transmission may prove to be a solution to the problem of cost-effectively serving remote areas (p. 47).

Furthermore, the Council recognized that “effective access to content largely depends on speed of access” (p. 47). Although they outline what low, medium, and high speed access would provide the user, they failed to actually state which of these access speeds they believed constituted a justifiable need. Again, this follows the pattern observed from the beginning of the policy process—a consistent reluctance to provide a concrete definition of access.

This second report shifted slightly from the 1995 report in that there is more acknowledgement of the value of the Information Highway for “citizen participation” (p. 39). However, these comments are muted by the subsequent framing of the citizen as a consumer:

Widespread public access to the Internet at the individual, institutional and community level is a precondition for producing a healthy consumer market for commercial products and services and for sustaining the viability of a business environment on the Internet (p. 40).

Furthermore, the commitment to public access at the institutional and community level appears to be decreased from the first report. While recognizing the CAP had been effective in helping those who did not own a computer gain access to the Web, the authors cautioned that there was some concern about the long term sustainability of the program, noting that “support from the governments can cover initial equipment costs, [but]

ongoing costs for staff and communications links can impose a heavy burden on community institutions and organizations” (p. 40). For example, CAP funding was provided to Taqramiut Nipingat Inc. to set up six telecenters in Nunavik (Nunavik.Net, 1998). The funding covered the cost of the necessary computers and related communities, while the communities were required to provide volunteer staff and space. However, the Internet users had to pay long-distance fees themselves to access the server located at TNI headquarters in Montreal, thereby incurring large personal expenses due to slow connection speeds. Furthermore, when the funding ran out in 1999, there was no further CAP funding, and the project closed down (Ibid).

With respect to any potential gender divide, there is again little call for action other than to reiterate the suggestion in the Federal Access Strategy that Gender Based Analysis should be conducted within federal departments where appropriate (p. 174).

2.8 Connecting Canadians

The concrete efforts of the Government to provide physical access for Canadians can be seen in the various components of the Connecting Canadians project. This project is one of the key components of the government’s strategy to “to make information and knowledge infrastructure accessible to all Canadians by the year 2000, thereby making Canada the most connected nation in the world” (Government of Canada, 1997). The government expanded its mandate in 2001, stating it intended to “achieve the critical goal of making broadband access widely available to citizens, businesses, public institutions and to all communities in Canada by 2004: (Government of Canada, 2001).

It is through the Connecting Canadians program, and its subsidiaries, the Community Access Program, the National Satellite Initiative and the Broadband for Rural and Northern Development Pilot Program, that one can get a sense of what access really means to the government, even it still not actually defined. In April 2000, a message from the Prime Minister was posted on the gateway to the Connecting Canadians website (Government of Canada, 2000). His message reads very much like a promotional advertisement for private industry to locate their businesses in Canada, rather than an access strategy. He highlights that software production costs are lower in Canada, labour costs compare favourably with other countries, and employer benefits are less costly. He makes special note of the “very favourable tax regimes” available to private industry for research and development. It is contradictory for, on the one hand, IHAC to tout the employment benefits for Canadians, while on the other hand the federal government promotes low labour costs.

The Prime Minister goes on to claim that Canada

will be a society where every child gets the right start in life and young people have a chance to be the best at whatever they choose to pursue. It will be a society where citizens have access to the skills and knowledge they need to excel, where families enjoy safe communities and a clean environment. It will be a place where we work together to promote peace, cultural diversity and the human purpose and benefits of the new global economy (Ibid).

This mission statement is the direct result of weak concepts of access. According to this mission statement, Internet access is conceived as the path to peace, safety, and favourable tax regimes. Given the ambiguity observed in the Federal Access Strategy and IHAC reports, it is not surprising that the mission statement for the Connecting Canadians program also demonstrates the same lack of focus on actually connecting Canadians.

What can be seen is a framing of the Connecting Canadians project as an invitation to private business to come and do business in Canada.

One of the major components of the Connecting Canadians strategy is the Community Access Program. Although this has already been discussed in part, the CAP website provides useful guidance in determining how the government defines access. It is clear that public access terminals are considered wholly acceptable for meeting the government's stated goal of witnessing Canada become the most connected nation in the world (Industry Canada, 2000). This program does give some recognition to the fact that there are access issues not just in rural and remote areas, but also in urban centers. Initially, the program was just for rural communities with populations up to 50,000, but in 2000, the program began accepting applications for CAP sites in population centers over 50,000 (Ibid).

It is important to recognize that the government, contrary to claims made in the Federal Access Strategy that it would "step in to ensure affordable access to essential Information Highway services for all Canadians, regardless of their income or geographic location" (Government of Canada, 1996), only actually steps in if they are asked by a community CAP organization, and as discussed above, only provides funding if the applicants have matching funding. The onus is on a community organization to take it upon themselves to try to run a CAP site, or to partner up with other CAP sites in the vicinity. Furthermore, CAP funding from the government is a one-time offer. The site or network is expected to use the funding to become a self-supported site (Industry Canada, 2000a).

Two other main components of the Connecting Canadians platform are the National Satellite Initiative and Broadband for Rural and Northern Development Program. These programs are similar to CAP in that there are startup funds made to successful applicant groups that must be matched by the group. The specific funding formula is 50% of eligible costs up to \$30,000, to be disbursed through a competitive process to “community champions” (Industry Canada, 2004). The program differs from CAP in that a second round of funding can be applied for.

These programs are “another step towards meeting the Government of Canada’s commitment to ensure broadband access is available to all Canadian communities” (Industry Canada, 2004a). This is one of the few times a specific access speed has been identified as an essential service. However, it is a little misleading regarding the speed. When most people think of broadband access, they think of high speed access, which is an average download speed of 3 megabits per second. However, with satellite, average transmission is 400 kilobits per second (Bell, 2004). While it is true that this is seven times faster than traditional dial-up at 56 kilobits per second, and better than no Internet access at all, it is not broadband in the technical sense of the word. However, an advantage to satellite is that users will be able to avoid paying long distance charges to access a server in Montreal when they may live in Nunavut.

2.9 Summary of Federal Documents

Before moving to the critics’ discussion of Internet access in Canada, in all the reports, strategies, and webpages, we have seen that there has been a great deal of discussion outlining the benefits of access, albeit often focussing on the economic benefits

to private industry. However, there are significant areas of neglect. The reports are primarily focussed on physical access sites, not frequency of use. As will be discussed throughout the rest of the thesis, how we use the Internet has become more important than whether or not we access it, and even where we access it. However, to find detailed discussion of Internet usage in Canada, one must generally look outside the federally published documents and instead turn to publications made by critical observers and public interest advocates. In these documents the issue of frequency of use is not only present, but is often the central theme.

Critics of the Canadian Access Strategy process have been also been more forthcoming than the federal government with respect to specific suggestions for policy initiatives. There has been an active and vocal network of public interest advocates mobilizing to respond to the various reports and programs issued by the federal government, IHAC and the CRTC. This chapter will specifically consider the three Universal Access Workshops that were organized in response to the IHAC process. It will also consider various arguments presented by public interest advocates not only from Canada, but also from the U.S. and Europe.

2.10 Universal Access Workshops

In response to the IHAC process, three Universal Access Workshops were organized in 1996 and 1997 (Clement et al., 2001) and facilitated by the University of Toronto based Information Policy Research Program (IPRP). These workshops were organized to provide a better forum for public interest advocates to participate in discussions surrounding the challenges facing universal access advocates. In a summary

from the second Workshop (David, 1997) the concept of an access basket is mentioned. In the publications from the government agencies, this idea is never mentioned. There was always a resistance to the creation of essential and non-essential services. The IPRP report argues that there should be “baskets of essential services in both the telecommunications and cable sectors [...]consisting of widely available services supplemented by low-cost access to electronic mail and other Internet services” (p. 4). One of the government representatives at the Workshop was not willing to support the notion of essential and non-essential services. He argued that “the distinction is highly subjective and not readily analyzable by the tools of modern economics. Market forces should be allowed to determine access” (p. 12). Moreover, he suggested that universal government assistance programs would address the needs of low-income customers (Ibid).

According to Winseck (1998), this position is consistent with a broader discussion of essential vs. non-essential services that has taken place over the last few decades. He maintains that competition for Internet services in Canada has always fallen within the realm of enhanced services, and that, according to the federal government, only basic telephone service is technically still considered an essential, regulatable service. Furthermore, he argues, given that all services are delivered over the same infrastructure, it can be suggested that the debate ends up being around social targeting of services rather than actually re-defining essential services.

Once again, ambiguous “market forces” are left to address access issues. However, it is important to note that the federal representative did not advocate any new policies to fill in where the private sector fails to provide access. Instead, he asserted that existing social assistance programs should be considered adequate for use as a policy

response. This demonstrates an admission on the part of the federal government that there are more than just urban/rural large scale geographic access issues. Regardless, current social assistance programs are often stretched to their limits, and it is unlikely they could absorb the added responsibility of addressing access issues.

The participants of the workshop provided a detailed description of various baskets of essential services for telecommunications. With respect to the Information Highway, the authors argue that all Canadians should have “local dial access without additional connection fee to electronic mail and a (fee charging) Internet Service Provider (ISP) of the customer’s choice” (p. 19). Although the group made no reference to in-home access vs. community access, the specification of free e-mail is possibly the first time this service has been defined as essential. Of greater note is the emphasis on having local dial access. As noted with the CAP example in Nunavik, customers still had to pay out of their own pocket for their long-distance charges to reach the ISP server. The authors also set a clear timeline, suggesting that by 2002 all Canadians should have an e-mail address and Internet access (p. 20). None of the government reports set an actual firm timeline.

In a proposal entitled *Key Elements of a National Access Strategy: A public interest proposal* (IPRP, 1998) there was a call for the development of appropriate measures to identify any access gaps as they emerge (p. 7), and suggesting that Statistics Canada should work in conjunction with public interest groups when developing the survey questions. This demonstrates a clear recognition that the existing statistical measures for examining Internet access in Canada required strengthening. However, IHAC had made the same recommendation a year earlier. The fact that public interest groups were still advocating for increased statistical analysis indicates that there was

continued concern about the data being produced. Moreover, given that Universal Access Workshop participants such as Ellen Balka and Leslie Regan Shade consistently call for the disaggregation of data to facilitate gender analysis, and such data is not available in the HIUS, it appears that such consultation either did not occur, or was not heeded. It is true that Cycle 14 of the General Social Survey (GSS), entitled *Access to and Use of Information Communication Technology*, conducted in 2000 was a disaggregated survey, permitting individual analysis. However, the GSS is conducted annually, with a different emphasis each year. The time-series, year-to-year comparisons provided by the HIUS surveys cannot be conducted with the one-time GSS. The next chapter will discuss in detail the development and analysis of the HIUS and GSS as well as the discussion reports issued by Statistics Canada.

A concrete example of a clearly stated access solution was proposed by the Coalition for Public Information (CPI). Founded by the Ontario Library Association, the CPI was asked to name a member to sit on IHAC, although their participation was “viewed by some as an example of co-opting one interest group to a forum dominated to such an extent by private sector interests that the public group allowed exclusive entry could have little impact” (p. 31). In 1994 CPI member Stan Skrzyszewski submitted a report for consideration in the first IHAC process (Skrzyszewski, 1994). In this report, the CPI suggested that “20% of the carrying capacity of the future broadband networks be reserved for non-profit agencies and civic participation” (p. 4). Furthermore, in recognition that access includes actual participation on the Information Highway, the CPI calls for a one-time levy to be paid by telecommunications and cable companies for the creation of a public foundation to support efforts to provide training and technical

consulting independent of government and corporate agendas (p. 4). Neither of these recommendations were included in the final IHAC report, nor have they been brought up again.

2.11 Public Interest Critical Responses

Several authors have made mention of the importance of linking access to actual technological competence and participation. Although referring specifically to U.S. policy, Gillett (2000) argues that “network infrastructure is overemphasized, while end-user services and equipment receive insufficient attention” (p. 147). She notes that:

In contrast to the phone system, the Internet is designed with much of its intelligence at the edges. Users gain significantly more flexibility from this design, but at a price. They are expected to connect to the system using equipment that is significantly more complex to operate than a typical telephone, and more expensive as well (p. 148).

As a result, Gillett supports arguments that education and training are crucial in any universal access policy. As noted above, this echoes what several other public interest advocates have also stated, and should be considered as an actual articulation of access parameters. Gillett does support community access sites, and does not argue for in-home access as an imperative.

One author who makes mention of in-home access is Kenneth Hacker (2002). He suggests that “Home access is better than work access. They are not the same in terms of usage. Thus, it is unreasonable to say that because people have work access, they have the same access that home computer owners have” (p. 21). Hacker’s main argument is that “for at least five years, most commentators have overreduced divide issues to access only—neglecting the fact that there are more substantial gaps in usage, skills, and

integration of Internet-related technologies” (p. 1). Furthermore, he is concerned that too many journalists and authors take data reports at face value, without considering the methodology and reporting methods (p. 2).

With respect to gender, Hacker argues that the gap for basic online access has closed (p. 14). Similar reports have been made about the access gap with respect to gender in Canada. However, he reiterates that “quality of access is an issue that remains largely unexplored and the gaps in quality of access are hardly reported” (p. 14). This thesis will undertake a detailed analysis of quality, and frequency, of access in Canada, specifically focussing on a comparison of usage patterns between men and women. Hacker believes that “study of usage gaps in detail is needed to find out how the digital divide slides forward as a set of gaps appearing with each new major communication technology as it appears to close with each communication technology that is getting old” (p. 24).

Hacker’s arguments echo arguments long maintained by Balka (1997), Shade (1998) and McGerty (2000). As noted above, Balka has consistently maintained the need for data disaggregated by gender, age, ethnic background and linguistic preference, with an emphasis on actual use of the computers in various locations—home, schools, and public access terminals (p. 5). Balka is not opposed to the notion of public access sites as an acceptable solution, but does note that the CAP program has previously failed to meet the needs of women’s organizations. She cites the example of a group in Newfoundland that wished to receive CAP funding to place computers in a women’s centre, noting that women infrequently used the library terminals. However, their funding application was denied by Industry Canada, with the CAP representative claiming that the application

privileged one group over another (p. 4). This is another example of how voluntary GBA is not the most effective method for ensuring equitable gender access.

Shade (1998) is a strong advocate of in-home access, particularly with respect to gender parity. She suggests that “true access and ubiquity will not be attained until networked technology is ‘easily’ and economically brought into the home. And such domestic ubiquity will significantly increase women’s access to the information infrastructure” (p. 37). Furthermore, with respect to usage, she recognizes the importance of interactive and dynamic resources “where users can be creators, collaborators, and contributors to the content” (p. 37). Although pressing for in-home access, she argues that:

It is important to differentiate between the placement of ‘informational appliances’ in the home sponsored by a cornucopia of information providers, and their attendant visions of ‘interactive’ home shopping ‘on demand’; and the public interest which takes as its focus the citizen and every day community needs...Citizens have been reduced to mere passive ‘consumers’ of the products that the telephone, cable, and television industries want to propagate. (p. 39).

Reddick (2002) concurs with Shade. He agrees that the ideal situation for Internet penetration is in-home use, but acknowledges that public access sites will play a necessary role for many years to come (p. 37). Furthermore, he echoes Shade’s concerns that the Internet runs the risk of “moving from ‘novelty status’ to that of the common place, or ‘banal’ with other technologies in the household” (p. 27). He differs from Shade in that he asserts it is still useful, and in fact is “nearing importance as an essential service” (Ibid), but that the public is viewing it more and more as an “optional form of communication sitting in a room or on a shelf with other technologies” (Ibid).

In fact, Shade and Reddick's arguments complement each other neatly. Perhaps Reddick's observations that the public view the Internet as banal is due in part to what Shade has noted—that much of the information available for immediate consumption on the Internet is itself banal, controlled and dished out according to the policies and corporate visions of the telecommunications industries. In order to access more useful information, it is necessary to have some basic Internet literacy and abilities to manoeuvre through search engines. These types of skills are acquired as one uses the Internet more and more frequently. Furthermore, the more skillful the user becomes, the greater their ability to physically filter out unwanted Flash and pop-up advertisements, and eliminate cookie software and spyware from their own computers, thereby further decreasing the control of the large corporate ISP's over what the user is exposed to while using their portals to access the World Wide Web. Filters would also decrease the amount of time it takes for the user to move from webpage to webpage, particularly if dial-up access is the only rate of speed available. Being able to decrease their surfing time might help encourage more people to use the Internet.

Further support for Shade and Reddick comes from an unforeseen source—an article discussing so-called Internet dropouts and infrequent users in the summer 2002 edition of *Canadian Social Trends*, published by Statistics Canada (Crompton et al., 2002). They acknowledge that, based on analysis of 2000 HIUS and the 2000 GSS, most former users cited “no need” as the main reason for no longer being online. Crompton et. al suggest that:

the World Wide Web either did not have what these people were looking for, or that they were content to use more conventional sources of information that do not demand expensive equipment or special skills. It may also indicate lack of time or difficulty finding what they were searching for (p. 2).

Furthermore, they observed that of the approximately 30% of “dropouts” predicting they would be returning to their online activities in 2003, over two thirds anticipated they would be using the Internet from home. Crompton et al. suggest that “other locations—such as work, school, or public library—were not nearly as conducive to a return to regular surfing, probably because they are simply too inconvenient for one reason or another” (p. 5). Similar results were observed among non-users. Of all the non-users, only 22% indicated any intention to get online, and of those, three quarters indicated they would not want to learn if it meant using the Internet in a library or other public place (Ibid). This calls into question the true potential of programs such as CAP.

2.12 Conclusion

This chapter has provided an overview of how, over the past decade, both the federal government, through various Councils and initiatives, and public interest advocates have defined the terms and contexts by which Canadian citizens have come to understand Internet access. Hacker and Mason (2003) argue that it is very important to consider who is presenting the information, and be aware of any bias that may exist in the report:

The digital divide statistics do not speak for themselves. Instead, they are used as fodder for various political and ideological groups that seek to influence government policies in either a proactive or laissez-faire direction (p. 99).

Hacker and Mason assert that the way political problems such as the digital divide are handled is directly related to how they are framed. For example, they note that in the U.S., the 2000 National Telecommunication and Information Administration (NTIA) report *Falling Through the Net: Toward Digital Inclusion*, issued under the Clinton administration, argues that the Internet is becoming more important than ever to “economic, educational and community advantages and that ‘people who lack access to these tools are at a growing disadvantage’” (p. 103).

The 2002 NTIA report, *A Nation Online*, issued under the current Bush administration, claims that the Internet is becoming a part of the lives of more and more Americans. The authors of the report state that it remains true that some Americans are disconnected from the Internet, but that inequality is decreasing. They conclude that America is “truly a nation online” (p. 103). However, Hacker and Mason note several contradictions within the Bush report. The report suggests that in-home access is most desirable, but Hacker and Mason observed that, in fact, the gaps the NTIA authors claim are closing are for Internet access from any location. Furthermore, data is presented in the report indicating that gaps for access from home are greater than gaps from access from anywhere, but that information is not brought to the forefront of the report (p. 103).

Hacker and Mason further argue that the 2002 NTIA report:

reveals a political framing process that dulls perceptions of a need to use government to close digital divide gaps [...] and provided the administration with a statistic tool that could justify the ensuing slashing of funds for existing programs designed to help those lagging in ICT access and usage (p. 107).

They believe that this report reflects a shift in the administrative majority in the country.

According to Hacker and Mason, the Clinton administration framed the digital divide as a

civil rights issue, whereas the Bush administration is framing it as a non-issue, “exemplified in the characterization given by Federal Communications Commission chairman Michael Powell when he called the divide a ‘Mercedes Benz divide’” (p. 107).

Hacker and Mason suggest the framing in the reports is supported by empirical research, and more specifically how the empirical research is presented. They argue that if one wants to find support for an ideology of hands-off government policy, “it is easy to find some diminishing gaps to cite over time. The narrowing gender gaps [for basic access] are a classic example” (p. 107). They recognize that the process can work both ways, noting that if one wanted to make a case for government involvement with closing gaps, it is easy to find gaps that persist (Ibid).

This discussion of framing sets up the next chapter of this thesis. This chapter has illustrated the reports’ emphases on the supposed economic benefits of a non-government intervention overall policy, and a tendency to produce vague concepts of access based on weak statistical measurements. Hacker and Mason, drawing from van Dijk, argue that:

Ideological framing of the digital divide begins with policy preferences and works back to data and research to provide evidence to support political claims. Rather than statistical closure of divide gaps, one finds ideological closure of the gaps (van Dijk, 2001) (p. 108).

In Canada, the IHAC and CRTC reports, as well as Federal Access Strategy and Connecting Canadians programs, all draw on data collection, analysis, and discussion from Statistics Canada. As such, the next chapters will take up an analysis and discussion of the datasets and reports issued by Statistics Canada. Hacker and Mason provide a few starting points for discussion. They suggest that in the U.S., there is an emphasis on physical connection rather than how much “network presence” a person has. Moreover,

they observe a recurring trend towards identifying non-users as “want-nots” instead of “have-nots”. This permits justification for a non-government intervention policy (p. 101). The same process can be observed in Statistics Canada publications, using the term Internet “dropouts” to characterize people who may have used the Internet at one point and have since curtailed, or completely dropped, their online activities.

Furthermore, they state that true time-series analysis is necessary and more useful than a one-time study (Ibid). Initially, it would appear that the HIUS surveys meet their criteria. However, as noted above, the HIUS are household surveys, making it very difficult to identify gaps that may exist within specific groups. The 2000 GSS provides the necessary disaggregated data, but is only a snapshot study.

It is true that this type of analysis could be charged with its own bias. Hacker and Mason recognize that participants on both sides of the debate can be accused of manipulating data to support a pre-determined ideological framework. The purpose of the analysis in the upcoming chapters is to focus on a discussion of the unexamined potential gender divide with respect to Internet access. At issue is the fact that the federal government has essentially declared the notion of a gender divide moot, and, as will be presented in the next chapter, Statistics Canada has provided data analysis to support that assertion. The problem is not so much whether a gender divide exists, but that basic research to make such a claim either does not exist, or is not reported, permitting the federal government to continue a policy of non-intervention.

What is unfortunate for the federal government is that it is possible that were such data available, with particular ability to examine frequency of usage and familiarity with Internet protocol, the data may show that the gender gap has in fact decreased across

various comparison points. However, given the repeated emphasis in the IHAC reports and the Federal Access strategy that Gender Based Analysis need only take place “where warranted”, and the very basic level of measurement provided by Statistics Canada suggest no such analysis is warranted, no further official discussion of a gender gap is likely.

Given the reluctance of the federal government and of Statistics Canada to do comprehensive Gender Based Analysis, I hypothesize that an analysis of the reports issued by Statistics Canada will show a muted discussion regarding potential gender gaps, and that any discussion will be guided by the premise that basic physical access from any location is enough to justify the closure of the gap. I further suggest that the document analysis will reveal a significant emphasis on the potential use of the Internet for e-commerce and commercial activities, reflecting the pre-existing emphasis of the government reports.

With respect to data analysis, given the historical links between income and gender (see Appendix B), and the consistent recognition that income and Internet access and use have a documented relationship, I further hypothesize that comprehensive data analysis will reveal a relationship between gender and Internet access.

Chapter 3

Measuring and Reporting on Internet Access in Canada

3.1 Introduction

In March of 2001, The Globe and Mail published an article entitled *Women narrow Internet gender gap* (Brethour, 2001). Brethour notes:

Men are still in the majority on the Web, but just barely. In 1994, 22 percent of men used the Internet, far ahead of the 14 per cent of women who were on-line. But in 2000, women had nearly drawn even, with 49.6 per cent using the Web, compared with 56.1 per cent of men (March 27, B1).

Upon reading the article in its entirety, one might be tempted to believe that there no longer exists a serious gender disparity in Internet access in Canada. The author was citing facts from the Statistics Canada report released outlining the results of the 2000 General Social Survey: *Access to and Use of Communication Technology*. However, Brethour's article fails to mention several key points, including the facts that the survey

was conducted over the course of 12 months, and that a respondent was considered to be connected to the Internet if they answered “yes” to the question “In the past 12 months, did you use the Internet from home, work, or somewhere else?”. Furthermore, the article does not include any comparison between men and women with respect to frequency of use, or any comparison regarding location of use.

This is a clear example of ambiguity in defining access leading to potentially weak access policies, as discussed in the first chapter. Brethour’s article claims, without any further investigation, that men and women use the Internet equally, and he therefore implies there is no reason to be concerned about an access divide based on gender. However, in similar style as the reports considered in the first chapter, the definition of access is quite vague. As noted above, there is no comparison of frequency or location of use between men and women, nor does Brethour question this lack of comparison.

The purpose of this chapter is to conduct a critical analysis of documents published by Statistics Canada regarding Internet access in Canada, with particular emphasis on the presentation of gender and income divides. It is anticipated that such an analysis will reveal deficiencies in both survey design and ensuing publications with respect to both gender and income divides in universal access measurements in Canada. These deficiencies are notable, given the detailed level of analysis that is allotted to various other divides, including urban/rural. However, as stressed in the last chapter, the federal government did not place much (if any) importance on the desirability of gender based analysis, mandating it only “where warranted”.

This chapter will provide a general critique of the Household Internet Use Surveys (HIUS) in comparison to what was actually recommended by IHAC, and will suggest that

the HIUS are designed in such a manner that they do not permit a full analysis of any potential gender divide. Furthermore, the corresponding reports generally fail to provide any critical analysis of what little gender divide information can be gathered from the HIUS, and use inconsistent methods with respect to the reporting of income disparities regarding access. The chapter will also incorporate a discussion of how the reports on HIUS and GSS presented by Statistics Canada can be used by the federal government to frame access to communication technologies as primarily essential to economic growth, and not the expansion of the public sphere.

Statistics Canada has been publishing reports measuring the use of Information and Communication Technology (ICT) in Canada since the early 1990s. One of the first significant reports was published in the autumn 1995 issue of *Canadian Social Trends*, the quarterly magazine published by Statistics Canada, in an article entitled *Preparing for the Information Highway: Information Technology in Canadian Households*. In subsequent years, Statistics Canada has produced numerous reports, with analyses based on the Household Income and Facilities Expenditures Survey (HIFE), the Household Internet Use Survey (HIUS), and Cycle 14 of the General Social Survey (GSS 14), culminating with the December 2003 release of the 251 page document *Canada's Journey to an Information Society*.

This chapter will not provide a detailed publication by publication summary, but will instead draw from several publications to examine how the Statistics Canada reports, the IHAC reports, and Federal Access Strategy and CAP program documents provide an interlocking framework for the promotion of a positive, commercially oriented body of official literature while systematically obscuring issues regarding gender disparities and

Internet access. This chapter will draw significantly from certain reports that can be considered benchmark reports, given that they present time-series analyses. These documents include *Plugging In: The Increase of Household Internet Use Continues into 1999* (Dickinson & Ellison, 2000), *Overview: Access and Use of Information Communication Technology* (Statistics Canada, 2001), *Changing Our Ways: Why and How Canadians Use the Internet* (Dryburgh, 2001), *Unveiling the Digital Divide* (Sciadas, 2002), and *Canada's Journey to an Information Society* (Statistics Canada, 2003). As discussed in the previous chapter, it is expected that these reports, and other official publications, will not only fail to adequately analyse any potential divide with respect to gender and Internet access, they will also serve to frame access to communication technologies as primarily essential to economic growth.

The shortcomings of these reports are brought more clearly into focus when compared with reports produced by the Public Interest Advocacy Centre (PIAC) (Reddick, 2000), EKOS Research Associates (Reddick, 2001, 2002), an academic report prepared by Bimber (1999), and a report produced for Orbicom (Sciadas, 2003), an international communications research group created in 1994 by UNESCO and Université du Québec à Montréal. Reddick's reports use disaggregated data collected by EKOS Research Associates, and he performs detailed regression analysis to create a typology of non-users in Canada. Similar analysis has not been undertaken for the Statistics Canada reports on the General Social Survey. What is particularly interesting about the Orbicom Report is that it presents a new framework for analysing and comparing the digital divide between countries, and has been edited by a prominent author from Statistics Canada,

George Sciadas. However, the analysis methods he helped devise for Orbicom cannot be found in the reports published by Statistics Canada.

Like the analysis in the first chapter, this discussion is based on McSorley's comments (2003) that we need to investigate "through what narrative frameworks the digital divide is ultimately articulated and how this foregrounds and obscures the various competing visions and delimits the parameters of policy intervention" (p. 77). The documents reviewed in the first chapter frequently make reference to the notion that there is a need to ensure that Canadians are connected to the Internet. Furthermore, they spend a significant amount of time discussing the importance of ensuring Canadians have the necessary skills to participate fully on the Internet. However, as Hacker and Mason (2003) noted with respect to the analytical documents produced in the U.S., the emphasis tends to be on physical connection rather than frequency and location of use, and an overall consideration of what people do with the Internet (p. 101). It is anticipated that the same basic emphases will be observed in the documents from Statistics Canada.

With respect to the issue of a gender divide, Balka's (1997) presentation to the Universal Access Conference in February 1997 highlights some of the key issues when considering gender and Internet access. She proposes that in order to:

improve women's access to the Information Highway [we need] solutions that reflect an understanding of women's day to day experiences (as parents attempting to give their children access to the Information Highway, as wage earners with less disposable income and less leisure time than their male peers, and frequently as women users dealing with male users and technicians in a world where technical expertise is gendered) (p. 5).

However, Balka recognizes that any such solutions will require extensive research. She recommends that we need "to have access to data that is routinely collected...but is not

routinely released by Statistics Canada...disaggregated by gender, as well as age, ethnic background, income level and according to linguistic preference” (Ibid, p. 5).

It is useful to keep Balka’s data collection suggestions in mind when considering Menzies’ report for Status of Women Canada (1998). Citing an unpublished EKOS report, she argues that although there is an indication that general access to the Internet is equalizing between men and women, the gap representing degrees of participation remains large. Furthermore, she highlights that cost is cited by 61% of single parents, who tend to be women, as a major reason for not owning a personal computer (Menzies, p. 15). Menzies suggests that even if the income divide were resolved, there remain “considerable constraints on women’s time for any use of computers and the Internet outside work given the hours women still put into housework, childcare and even yard work—and the continuing gender gap in the sharing of essential work” (p. 15).

3.2 Public Interest Perspective

The research provided by Bimber (2000) and Reddick (2000, 2002) reinforces the need to have the kind of disaggregated data identified by Balka. They also provide useful guidelines for research methodologies to apply to the available datasets from HIUS and GSS. However, it is impossible to exactly replicate Bimber and Reddick’s research with HIUS surveys because they use individualized data.

The next chapter will present extensive data analysis conducted by this author, based in part on the methodologies presented by Bimber and Reddick using the disaggregated GSS variables, and will also attempt to disaggregate the HIUS data to apply their methodologies. This chapter will begin with a detailed review of Bimber and

Reddick's research in order to provide a concrete contrast for the discussion regarding the Statistics Canada reports. Sciadas' Orbicom report will be discussed after the Statistics Canada analysis has been completed.

In his article, Bimber used data collected from surveys conducted in 1996, 1998, and 1999 in the U.S. Each year the surveys returned just over one thousand responses from adults across the U.S., bringing the total number of responses to 3032 (Bimber, 2000, p. 871), far fewer than are available through the HIUS in Canada. The purpose of Bimber's research was to examine "the characteristics of the gap between men's and women's presence on the Internet, and [to determine] to what extent the gap is gender-specific rather than the result of socio-economic inequality" (Ibid, p. 869). Using socio-economic and gender measurements as independent variables, he observed that there were two gender gaps present. The first was with respect to access, and the second with respect to frequency of use.

Similar to the results observed in the 2000 GSS, his statistically significant results for analysis of basic access indicated that by 1999, 60% of men had Internet access from home, work, or school, compared to 50% of women. He notes that the 10% gap between penetration rates for men and women is an increase over the results he observed in 1996 and 1998. For those two years, 5% more men had access than women, but these results did not reach statistical significance. As such, he notes that not only did the penetration gap increase from 5% to 10% in 1999, it reached statistical significance, meaning the results can be reliably applied to the general population. He then broke down frequency of use into three categories: frequent (daily), moderate (weekly), and infrequent (less than once a week). He notes that his statistically significant results demonstrate that from 1996

to 1999, men consistently outnumbered women with respect to frequent use. In 1996, men outnumbered women in the moderate use category, but by 1999, women outnumbered men. In 1996, women were again far more likely than men to be infrequent users, however, by 1999 the gap had closed in this category, with both groups essentially equal with respect to infrequent access (Bimber, 2000, p. 872).

In order to examine these differences more closely, Bimber used the technique of logistic regression, which provides a prediction of the odds of one group behaving in a certain manner compared to another group. He specifically used variables in his 1999 dataset. His results revealed that only socio-economic variables such as age, education, and income played a statistically significant role in determining whether or not one had access to the Internet, but that both gender and socio-economic variables were important when evaluating frequency of use (p. 873). Specifically, education, age, income, employment status, marital status, and whether or not one was a housekeeper were statistically significant in predicting whether or not one had access to the Internet. Gender did not reach statistical significance in this analysis.

With respect to frequency of use, education, gender, race and employment status were all statistically significant in predicting frequent (daily) Internet use. In fact, each of these variables exert a comparatively equal effect on frequent use, with gender predicting that women are less likely to access the Internet on a frequent basis than men. However, when the same logistic regression is performed with moderate (weekly) Internet use as the dependent variable, gender is the only variable to exert a significant effect, suggesting that gender is predictive of moderate Internet use, with more women in this category than men (Ibid, p. 874). Bimber's results can be seen in Table 3.1.

Table 3.1: Logistic Regression Analysis of 1999 Access and Use

	Access		Frequent Use		Moderate Use	
	B (std)	(sig)	B (std)	(sig)	B (std)	(sig)
Education	0.29	0.00**	0.11	0.02*	0.08	0.11
Age	-0.27	0.00**	0.06	0.28	-0.09	0.07
Income	0.26	0.00	0.01	0.78	0.005	0.94
Sex	-0.02	0.61	-0.10	0.01**	0.11	0.01**
Latino	0.01	0.81	-0.12	0.05*	0.02	0.64
Race		0.82		0.06		0.44
Black	-0.05	0.53	-0.07	0.53	-0.09	0.39
Asian/other	-0.06	0.54	-0.25	0.06	-0.16	0.21
Employed	-0.06	0.08	0.13	0.01**	0.02	0.68
Married	0.07	0.05	0.01	0.82	-0.05	0.29
Housekeeper	-0.13	0.001**	0.08	0.12	-0.003	0.96
Constant	-1.00	0.14	-1.29	0.11	-0.83	0.26

* significant < 0.05; ** significant < 0.01

Bimber, 2000 p. 873

As a result of his analysis, Bimber suggests that although a basic gap in Internet access exists, it is the product of socio-economic variables, not gender itself, but that “for some reason or combination of reasons that are gender specific, and that have yet to be explained, women are less intensive Internet users than men” (Ibid, p. 874). He draws from his own literature review, to hypothesize that some of the reasons for this may involve “stereotyping [signaling that computer technology is more appropriately male than female], inherently ‘gendered’ technology embodying male values, content that favors men, sex differences in cognition or communication...underlying differences in communication styles” (Ibid). Although Bimber does not specifically mention training

and skill level and technology ownership, his remarks dovetail with Menzies' observations (drawing from Balka) that:

Women's use of the Internet strongly depends on whether they actually own and control the technology to which they have access, and whether they have access to relevant training and other support mechanisms that will enable them to go beyond mere access and computer literacy (Menzies, 1998, p. 14).

Bimber's study reinforces the emphasis of Menzies and Balka, and Hacker & Mason, that it is vital, if not more important, to analyse not only the basic question of general access, but also the degree of participation on the Internet. Although reference is made in the policy documents produced by the federal government to understanding how Canadians actually use the Internet, more often than not the focus is on basic access and getting as many Canadians as possible connected.

Reddick's studies use Canadian data collected by the private polling firm EKOS Research Associates Inc. He produced three reports using EKOS data, the first published by PIAC in 2000, and the second two published by EKOS in 2001 and 2002. However, most of the focus for this chapter will be on Reddick's first report, *The Dual Digital Divide: The Information Highway in Canada*. Specifically, this report provides an interesting contrast to Dickinson & Ellison's *Plugging In: The Increase of Household Internet Use Continues into 1999* (2000) report (*Plugging In*), released in the same year. Both reports discuss digital divide issues, but whereas Dickinson & Ellison downplay any real concerns about why people are not using the Internet, Reddick uses a completely different methodology to attempt to get a clearer understanding of non-users. Specifically, Reddick makes an effort to create a typology of non-users, immersing his research in an analysis of those Canadians not connected to the Internet. Statistics Canada did release an

article in 2002 discussing so-called Internet dropouts, and infrequent and non users (Crompton et al., 2002), but it is not nearly as comprehensive as the work Reddick has produced over the years using EKOS data.

In his first report, Reddick used data collected by EKOS in a three stage process over a ten month period from September 1997 to June 1998. Thus, the data are significantly older than that used by Dickinson & Ellison in their report. Furthermore, Reddick has a much smaller sample at his disposal than is available to Dickinson & Ellison for their research. Nevertheless, Reddick developed a three tier typology of non-users. His analysis revealed that non-users fall into two broad categories, and three distinct typologies. He refers to the two broad categories as near-users and distant-users. Near-users have some interest in connecting to the Internet, but face cost/affordability and literacy barriers, among others. Distant-users consist of “people who have little or no interest in the Internet and online services, or perceive no value in the Internet to meet their everyday economic or social needs” (Reddick, 2000, p. 2). Delving further, using multi-variate regression analysis and logistic regression analysis, he created three typologies to “provide insight into the attitudes, values, and social circumstances that affect connectivity” (Ibid).

Type 1 non-users most closely resemble near-users—they have some interest in becoming connected to the Internet, but lack the technical skills and the financial ability to follow through. He notes that women are over-represented in this group by a ratio of two to one (Ibid, p. 3). Type 2 non-users also face technical and cost barriers, but more importantly tend to view the Internet as unable to provide any personal or social benefit. Once again, the proportion of women in this group is higher than men, but there is also a

strong tendency for members of this group to be in the pre-retirement age group of 45-55 years old. Finally, Type 3 non-users are characterized as unlikely to connect to the Internet at all. Reddick suggest they are unlikely to “derive any personal benefit from access, and are not likely to have the resources or social skills and interests to benefit from current Internet access” (Ibid). This group is also dominated by women, and tends to comprise seniors and retired Canadians.

As will be discussed in greater detail further in the chapter, Dickinson & Ellison’s *Plugging In* report presents a very different picture from Reddick’s analysis, suggesting that overall connectedness has risen over the years, and that the issue of non-users is not a huge concern. Drawing from the 1997, 1998, and 1999 HIUS, they suggest that there exists a strong relationship between household income and Internet use that has persisted across the three surveys, but downplay any analysis of the difference of penetration rates among income quartiles (Dickinson & Ellison, 2000, p. 4). Reddick does not dispute that Internet connectedness is rising among Canadians, but he provides a much more detailed analysis of why people are not connected.

Reddick’s methodology is not easily applied to the HIUS because he used disaggregated data, and the survey design incorporated specific attitudinal questions that permitted his typology of non-users to be created. In summing up the results of his typology analysis, Reddick considers the impact of cost and technological literacy to be critically important factors determining the likelihood of Internet use in the future for current non-users. Specifically, he re-iterates that for about half of the non-users, the actual ability to use the Internet was considered a valuable skill to learn, but their current situation did not permit them to acquire the technological literacy necessary at that time.

Furthermore, Reddick asserts that Internet access alone will not be enough to overcome the social and economic inequalities and cleavages in communities or society at large:

as the Internet joins the mix of mainstream communication technologies, programs that address technological access and social proficiency will be necessary to create opportunities for people to maintain a competent level of participation in society. In the alternative, non-users risk being further disadvantaged over the long term (Reddick, 2000, p. 4).

In contrast, Dickinson & Ellison are particularly focussed on basic access, and the demographic characteristics of who has access (neglecting any discussion of gender). Unlike Reddick, they made no attempt to quantify the groups beyond the basic demographic level. Moreover, the discussion is muted under the larger assertion that overall Internet access is progressing quite well across the country.

Reddick initially observed similar results as Bimber with respect to a gender division along the issue of access—56% of men have access compared to 45% of women (p. 37)—and Reddick also performed logistic regression analysis, with the independent variable being “Did you use the Internet in the past three months”. Like Bimber, the question applied to any location. His statistically significant results revealed that income and education had the strongest effects, while gender had a slightly smaller predictive influence, with the likelihood of access increasing if the respondent was male (p. 38). However, when he broadened the scope of his logistic regression analysis to include factored variables measuring attitudes about the Internet, the effect of gender on access did not achieve significance (p. 39).

However, the three month time line corresponds to Bimber’s infrequent use category, the same category in which he determined that gender was not a significant factor in determining Internet use. Furthermore, Reddick’s timeline essentially refers to

basic access, which has experienced a significant reduction in terms of a gender gap. These factors could help explain why Reddick did not observe any significant influence from gender on the access variable. As noted earlier, it is hypothesized in this thesis that logistic regression analysis on disaggregated HIUS, and the 2000 GSS using frequency categories along the lines of Bimber will reveal some influence from gender.

It should be recognized that both Bimber and Reddick observed the gender variable exerting some significant influence with respect to Internet access. Bimber's logistic regression analysis revealed an influence with respect to frequency of access, but not for basic access. Reddick's analysis revealed an influence with respect to basic access that was diminished with the subsequent inclusion of attitudinal variables. These conflicting results provide further support for a continuation of study with respect to the gender variable. Gender appears to have some influence, but does not behave in as straightforward a manner as income.

Furthermore, as noted above, Reddick acknowledges that women are over-represented in all typologies of non-users, and cites earlier EKOS research documenting that women make up over half the non-users, and those women online tend to be light users, while males tend to make up the majority of moderate to heavy users (p. 18). Reddick's methodology is significantly different from Bimber's in that Reddick was able to create attitudinal factor variables to use in regression analysis regarding access, but he did not apply the factored variables or basic socio-economic demographic variables in a regression analysis regarding frequency of access, given that his focus was on non-users.

In Reddick's second and third reports, *Rethinking the Information Highway: Rethinking the Dual Digital Divide* (2001) and *Tracking the Dual Digital Divide* (2002),

the results change slightly. He finds that income is still by far the most important factor determining Internet access, but that gender, education, location, and age are still good predictors. Specifically regarding gender, he notes that cost is a greater barrier to women than to men with respect to having in-home Internet access, and that men are more likely cite lack of need as their reason for not having in-home (Reddick, 2001, p. 13). This is an interesting observation. It could be that men are accessing the Internet more from their place of employment, and thus have no need to access the Internet from home. Again, this kind of analysis was not conducted in the Statistics Canada studies. The following chapter will include a disaggregated analysis of the location where men and women are accessing the Internet on a regular basis.

Reddick notes that his analysis of 1997 EKOS data revealed a 39-point gap separating respondents in the upper-most and lower-most income categories. That gap had expanded to 49 points in 2000, and 48 in 2001 (Reddick, 2002, p. 7). As will be discussed later in this chapter, this type of expansion has been traditionally downplayed in Statistics Canada reports. Furthermore, Reddick concludes that the overall concept of the digital divide needs “to be broadened to more appropriately incorporate the importance of the integration of ICT with other skills and activities in people’s lives” (Reddick, 2001, p. 67). Again, this is an assertion rarely, if at all, highlighted in Statistics Canada reports. Their focus tends to be solely point of access measurement. In a more detailed analysis than he provided in his first paper, Reddick, like Bimber, provides a comparison of

frequency of access between males and females (see Table 3.2), although he does not continue with logistic regression analysis in the final two papers.

Table 3.2: Frequency of usage: males vs. females

Demographics	Males	Females
Daily/Almost Daily	68%	61%
Less Frequent	32%	39%

Reddick, 2002, p. 9

Reddick also provides a measurement of frequency of usage contrasting how long the user has been online in comparison with how frequently they use the Internet. This is an important measurement because it demonstrates the importance of getting people online as soon as possible, given that it can take 2 years before we might observe daily or almost daily usage (see Table 3.3).

Table 3.3: Frequency of usage: length of time online

Length of time online	<1 yr	1 to 2 yrs	2 to 4 yrs	4 to 6 yrs	6 yrs +
Daily/Almost daily	38%	48%	62%	75%	86%
Less Frequent	62%	52%	38%	14%	14%

Reddick, 2002, p. 9

Once again, Reddick has focussed much of his research on non-users, and examined barriers to using the Internet. In addition to income, regional, employment, and educational sub-groups, he specifically considers the differences in barriers to in-home access between men and women. He breaks the barriers into three main groups: cost, interest and need. Women consistently cite cost more frequently than men as a barrier to accessing the Internet, while men consistently cite need (see Table 3.4). It is possible that men do not need in-home access because they have access at work. However, once again,

this kind of analysis is not undertaken in the Statistics Canada publications. A data analysis of location of use and gender will be conducted by this author using the HIUS further along in this chapter.

Table 3.4: Barriers to access and gender

	Cost		Interest		Need	
Gender	Male	Female	Male	Female	Male	Female
1997	27%	28%	29%	31%	45%	42%
1999	39%	45%	32%	33%	29%	22%
2000	36%	39%	31%	29%	33%	31%
2001	27%	29%	42%	39%	31%	32%

Reddick, 2002, p. 13

It is important to articulate some criticisms of the EKOS survey and the corresponding EKOS report itself. EKOS' press release announcing the first report, dated February 23, 1998, indicates the study is produced from the first wave of EKOS' Information Highway and Communication Household Study. Frank Graves, the president of EKOS, announced the survey was "launched as a partnership between the private sector and the government, and is perhaps the most comprehensive study in Canada to date relating to the Information Highway, underlying attitudes, and the relationship to the Canadian Household" (EKOS, 1998). However, the first HIUS would already have been conducted at this point, with the expectation that it would be an annual survey. It is unclear why government departments would be partnering with a private survey firm to conduct a survey similar to an annual one that Statistics Canada has already begun to compile a report on. Furthermore, if these departments truly wished to have the kind of measurements provided by the EKOS survey, one might have expected to see a revision of

the HIUS for 1998, 1999, 2000 and 2001 to reflect individuals as opposed to households. However, such a revision did not take place.

The EKOS Overview of Findings discussing the survey presents more questions than answers. The introduction states that “the project was designed as a horizontal partnership with the private sector and government to enable different partners to benefit from research typically beyond the scope and budget of any one organization” (EKOS, 1998a). However, when one reviews who the sponsors of the study are, it is hard to understand why this survey would be beyond the scope of any of their budgets. Federal government departments include Canadian Heritage, Industry Canada, the Treasury Board, and Agriculture and Agri-food Canada. Private industry sponsors include Rogers Cable Systems and Bell Canada. When one thinks of cash-strapped organizations, Rogers and Bell do not typically come to mind.

The survey sample for the first report was 3,500 cases. Statistics Canada regularly performs surveys that have sample sizes upwards of 40,000 cases. Moreover, the EKOS report would only be available to the public for a very high fee, if at all. Surveys conducted by Statistics Canada are usually available for academic research purposes for free through university libraries to students and professors under the jurisdiction of the Data Liberation Initiative. Given the emphasis of the federal government in all of its literature citing the benefits of the Internet with respect to making government services more easily accessible for the general public, it is surprising to see the same departments (i.e., Industry Canada) responsible for the creation and publication of official policy framework documents participating in survey processes that are, for the most part, inaccessible to the members of the general public.

As a side note, the EKOS Overview of Findings also highlights the difficulty in achieving repeatable results. Analysis was derived from the first survey that reports that 28% of Canadians have access to the Internet from their homes. However, the 1997 HIUS survey found only 16% of Canadians have in-home access. In a footnote, EKOS recognizes that their results are somewhat higher than Statistics Canada. They theorize that it may be due to the time lag between sampling and analysis.

These kinds of privately funded surveys appear to demonstrate a continuation of the pre-existing relationships observed on the Board membership of IHAC. It is especially troubling given that the final IHAC report, drafted with the full agreement of Rogers and Bell Canada board members, concurred with the CRTC recommendation that Statistics Canada assume responsibility for measuring and documenting the degree of Internet access across Canada. Moreover, it is important to distinguish between the report that Reddick produced for PIAC using EKOS data, and the press release and study overview that EKOS produced. Reddick's report used the data collected with the funding provided by the larger group, but his actual report was created in partnership with EKOS, Industry Canada and HRDC alone. Thus, corporations like Bell Canada and Rogers would get the benefit of the higher statistics generated by the EKOS survey with respect to overall Internet penetration in Canada, but could distance themselves from the more critical research produced by Reddick examining the significant issue of non-users.

Finally, with respect to Reddick's reports themselves, he assiduously discusses gender divide and Internet access. In each of his reports he includes gender as a variable in regression analysis, and provides specific sub-chapters to explain his observations regarding the differences between male and female non-users. This is far more than is

afforded in the Statistics Canada reports. However, in Reddick's reports and in the Statistics Canada reports, income is usually given the most attention as the most important factor determining Internet access. In fact, in the editorial of the Winter 2001 edition of Canadian Social Trends (Statistics Canada, 2001), the editor notes that the correlation between socio-economic status (higher incomes and educational level) and Internet use is so well documented that there is no need to revisit the issue in each article. (p. 3). What is not mentioned, either by Statistics Canada or Reddick, is the statistically supported link between gender and income and SES (see Appendix B).

Given the lack of attention the issue gender divide received in the IHAC reports and other federally produced policy documents, it is not unexpected in the Statistics Canada articles. However, Reddick has made a specific attempt to include gender for consideration as a factor in the digital divide, and takes the time to perform several data comparisons that include examinations of the potential influence of gender on the digital divide. In fact, for Reddick, gender analysis is performed and discussed as part of his routine data analysis, as if it is part of the standard analysis package. As such, it is disappointing to see him neglect to mention the well documented link between income and gender (Statistics Canada, 2000) For further discussion, see Appendix B.

3.3 Survey Design discussion

The first Household Internet Use Survey was completed in 1997 and has been conducted every year since. The survey met some of the recommendations included in the final IHAC report. As noted earlier, the report suggested that the CRTC should monitor access to the Internet in Canada "with particular attention paid to people in remote areas

and people with low incomes and disabilities [...] and call[ed] on Statistics Canada to develop ways to measure access and collect and publish the relevant statistics” (Clement et al. 2001, p. 36). This discussion will focus specifically on the issue of survey design.

The HIUS are conducted in conjunction with the Labour Force Surveys (LFS), and have a response of approximately 35,000 cases. However, the survey is not distributed to “residents of the Yukon, Northwest Territories, or Nunavut, persons living on Indian reserves, full time members of the Canadian Armed Forces and inmates of institutions” (Dickinson & Ellison, 2000, p. 2). According to their report, the residents of these excluded areas represent 2% of the population. However, given that IHAC specifically directed Statistics Canada to measure access in remote areas, it is difficult to see how these surveys comply.

In a personal interview with George Sciadas, Chief, Information Society Research and Analysis (Sciadas, 2004/05/28), he justified the use of the LFS as the vehicle for the HIUS as a decision of convenience, fiscal responsibility, and time expediency. According to Sciadas, his department was able to get the HIUS out for public response much more quickly by tacking it onto the LFS. This permitted the HIUS survey size to be significantly reduced because there was no need to include basic demographic data. Furthermore, the sample size of the LFS is quite large, more than would have been feasible had the HIUS been conducted as a stand alone survey. Finally, by adding the HIUS as a supplement to the LFS, this permitted Sciadas’ department to begin collecting HIUS data in 1997. Had they waited to create an entirely new survey, it would have taken two to three years before the first HIUS would have been conducted, given the lengthy survey design, testing, and approval process (Ibid).

When comparing the HIUS surveys to such datasets as Bimber's and Reddick's, as well as the 2000 GSS, their initial advantage is that the HIUS surveys produce annual, publicly available datasets. Bimber and Reddick used private datasets that must be purchased. Both the HIUS and the 2000 GSS are useful in that they measure access separately from several locations such as home, work, school, or library, although, like Bimber, they frequently only report analysis results for general access from any location. The HIUS and 2000 GSS can also be re-coded to create frequency of use categories similar to Bimber's analysis.

Frustratingly, when Statistics Canada does release datasets, there are restrictions placed on some of the variables. This suppression is supposed to ensure privacy and confidentiality for the respondents, but has the effect of restricting the kinds of research that can be conducted. For instance, the raw income variable is suppressed in the public datasets, forcing an outside researcher to use pre-coded quartile variables. This may not appear problematic given that both Bimber and Reddick used income quartiles in their analyses. However, Statistics Canada has not traditionally suppressed this variable in other datasets. For instance, in the Household Income Facilities and Expenditures Surveys (HIFE), which were used before the introduction of HIUS, the income variable was publicly available, and could be re-coded to provide an income breakdown along quintiles (20%) or even deciles (10%) should the researcher choose. This kind of re-coding permits measurements to be made along the extremes of income distributions. With the HIUS, one is obliged to use the breakdown provided by Statistics Canada.

The assertion that the raw income variable is suppressed for privacy reasons is unconvincing. It is true that demographic data usually includes a variable indicating

which CMA (Census Metropolitan Area) the respondent lives in. As such, a researcher could do a quick comparison of raw income by CMA. If the results turn up a respondent in a specific, and particularly smaller CMA, indicating annual household income of (for example) \$50,000,000, then it may be possible to make an educated guess as to who that respondent is. In order to circumvent this very remote possibility, the HIUS data is presented in quartiles. However, as noted above, HIFE used to provide the raw income data, as well as CMA information. If Statistics Canada is truly concerned about possible privacy issues, but still wanted to provide as much information as possible in the micro-data to the researcher, instead of just a pre-coded quartile variable, there could be pre-coded quintile and decile variables available as well.

As tools for measuring a gender divide along lines suggested by Balka, Shade and Menzies, or using methodologies outlined by Bimber and Reddick, the HIUS do not perform very well. Because they measure “household” access, it is challenging to isolate individualized gender variables. The only variables that proves useful for potential disaggregation are the indicator variables for gender of the head of the household and type of family (i.e., single person family). In the methodology section of the next chapter, I include a detailed explanation on how I have attempted to disaggregate the HIUS, and subsequent data analysis.

As far as survey design goes, the 2000 GSS, is much better than the HIUS. As mentioned earlier, it provides the necessary disaggregated data to analyse the gender divide in Canada with respect to Internet access. Furthermore, the variables that have been used to measure frequency of use are available for various locations—home, work, school, public access site, or even a friend’s house. It is still necessary to do some minor recoding

to achieve the same categories as Bimber presented (frequent, moderate, and infrequent), but the analysis will provide a much more detailed characterization of relationship between frequency of use, location of use, and gender than Bimber was able to provide with his dataset.

Curiously, even Statistics Canada analysts recognize that the aggregated format of the HIUS poses a significant problem. In their discussion of Internet “dropouts” and infrequent users, Crompton e. al. (2002) note that data from the HIUS cannot provide any analysis of individual members of the households, but “this missing piece of the puzzle is addressed by the 2000 GSS, which collected detailed information about the individual’s use of technology, allowing researchers to focus on personal use of the Internet” (p. 3). However, they stop short of suggesting that Statistics Canada should conduct regular disaggregated surveys.

In our discussion, Sciadas acknowledged that the HIUS were a poor vehicle for measuring individual usage (Ibid). However, he observed that, in 1997, Statistics Canada was concerned with measuring basic access, and so, household measurement was considered an acceptable level of analysis. Today, he is more concerned with usage issues, including intensity of usage and type of usage. As such, he indicated that an individual HIUS has been designed and is scheduled for implementation next year. However, due to internal issues (mostly financial), it is possible that the individual HIUS will be shelved, with the household HIUS being discontinued. Sciadas indicated that if the decision is made not to implement the new, individual HIUS, he will recommend that it be run on a bi-annual basis (Ibid).

Crompton et al. use a different framework for defining “regular users” than either Bimber or Statistics Canada itself. Bimber qualifies a frequent user as a daily user, a moderate user as weekly and infrequent as monthly or less. When discussing the HIUS surveys, Statistics Canada generally refers to a regular use household as one “that responded yes to the question ‘in a typical month, does anyone in the household use the Internet from any location’” (Dickinson & Ellison, 2000, p. 1). Crompton et al. refer to a regular user as one who used the Internet at least five hours per week, and an infrequent user as one who uses it monthly or less. These definitions are more in line with Bimber’s categories than the standard Statistics Canada definition, further demonstrating the importance of attempting to get a full, clear and consistent understanding of the data collected. If Dickinson & Ellison had used the daily use guideline to categorize regular Internet use households, the penetration rates would likely drop significantly. In addition to performing a disaggregated gender comparison regarding frequency of use further in this chapter, an analysis comparing the entire household and daily use will also be considered.

There are some additional concerns regarding the survey design. There is a significant emphasis on e-commerce activity in the 2000 GSS survey. A large proportion of the survey questions concern purchases made or researched online, or whether or not the respondent has even considered possibly using the Internet to make future purchases. As will be discussed in greater detail further in this chapter, household e-commerce represents 0.3% of the total gross national expenditures in Canada (Sciadas, 2003, p. 107). For the amount of attention paid to e-commerce activities in this survey and subsequent HIUS, it seems disproportionate to the amount of actual e-commerce activity.

Furthermore, there are no questions with respect to gambling or pornography purchases online. Given the general acknowledgement that these two activities represent a significant portion of financial activity online, and the detail to which other e-commerce activities are examined, it is an interesting omission. There are three questions regarding pornography in general, asking if the respondent came across pornography in their general searches, if they looked for it specifically or came across it by accident, and if they were offended by it. To be fair, it is quite likely that even if a question were included about pornography purchases made online, one could expect a certain degree of under-reporting amongst respondents, similar to respondents tending to underestimate their weight. Furthermore, there is no mention of online gambling at all. Again, it is possible that the issue of under-reporting would present itself, and Internet gambling sites tend to be licensed outside of Canada, but it is still an expenditure made by many Canadians. More likely however, is that these types of questions do not provide the kind of analysis desired by the federal government. Surely the Minister of Industry would prefer to report that Canadians are using the Internet to purchase televisions and washing machines, rather than acknowledge that the greatest use of the Internet with respect to e-commerce activity is for pornography and gambling.

In our discussion, Sciadas (Sciadas, 2004/05/28) indicated that the e-commerce section of future surveys would be significantly enhanced. He asserted that e-commerce is growing very quickly and that the clients interested in this survey are particularly interested in e-commerce issues. The primary client for the HIUS is Industry Canada (Ibid).

3.4 Summary of Survey Design Discussion

This discussion of survey design and conflicting definitions of access draws attention back to comments in the first chapter regarding ambiguous definitions of access. As indicated by Sciadas, the HIUS surveys were primarily intended to examine basic access in Canada. This follows from the IHAC reports and Federal Access Strategy. Although there was a passing mention of potential income and urban/rural divides, those documents did not place a detailed examination of access divide issues as a high priority. As such, the decision was made at Statistics Canada to include the HIUS as a supplement to the LFS. Had greater weight been placed on the need for clear, detailed data regarding access divides in Canada in the foundation reports, then there would likely have been greater pressure, and subsequently greater financial resources allocated, at Statistics Canada to develop a more in-depth survey.

Furthermore, as will be discussed in further detail in the next section, the definition produced by Statistics Canada of a regular Internet user shifts depending on who the primary author is. Dickinson, Ellison, and Sciadas tend to define a regular use household as one that is uses the Internet in a typical month from any location. The definition produced through Dryburgh's analysis refers to a regular user as one that used the Internet from home, work, or school at least once over the previous 12 months. As noted above, Crompton et al. referred to a regular user as one who used the Internet at least 5 hours per week (almost daily), and an infrequent user as one who used it monthly or less. As will be discussed in the next section, Silver looked at weekly Internet usage patterns in seniors, examining several possible divide sites, including age, gender, education and geographic

location. Clearly, policy makers have a wide range of definitions to choose from when determining what kind of access issues to address.

3.5 Statistics Canada Report Discussion

The problems associated with survey design only represent a small part of the story. It is important to examine how the results of the survey analysis are published by Statistics Canada, as well as to study what analyses are actually performed, both in terms of how gender is approached or not approached as the case may be, and how the reports frame the issue of universal access as an economic necessity. As a basic definition, a regular-use household is considered one that had anyone in the household connect to the Internet from home, work or school at some point in the past month. Bimber and Reddick refer to this level of use as infrequent access.

In Dickinson & Ellison's *Plugging In*, no mention was made of any analysis of potential gender divides. They focus instead on income divides. However, I used the same publicly available datasets they did (HIUS 1997, 1998, 1999) to compare female-headed households and male-headed households and general Internet access, asking if anyone in the household had ever used computer communication from any location. The results were as shown in Table 3.5.

For these years considered by Dickinson & Ellison, the gap between male-headed households and female-headed households grew from 12.6 points in 1997 to 17.3 points in 1999, but again, there is no acknowledgement of this growth. If you continue the analysis though 2001, the gap increases to 19.0 points in 2000, but decreases to 16.7 in 2001. No further data is available to determine if the gap continues to decrease. However, this

Table 3.5: Have ever accessed Internet from any location

Year	Male-headed hhold		Female-headed hhold		Gap M/F	Incr. on prev. year
	Have accessed	Never accessed	Have accessed	Never accessed		
1997	41.5%	58.5%	28.9%	71.1%	12.6pts	–
1998	49.7%	50.3%	33.7%	66.3%	16.0pts	+3.4pts
1999	53.3%	46.7%	36.0%	64.0%	17.3pts	+1.3pts
2000	63.1%	36.9%	44.1%	55.9%	19.0pts	+1.7pts
2001	72.0%	28.0%	55.3%	44.7%	16.7pts	–2.3pts

question merely asks if anyone in the household has ever accessed the Internet. As discussed previously, the issue at hand is not merely access, but frequency of access.

To be fair, when the same kind of analysis is performed to determine any differences between male-headed and female-headed households and what Dickinson & Ellison consider regular household Internet use (monthly), the gap between male and female households narrows somewhat. In comparing male and female led households and their response to the question, “In a typical month, does anyone in the household access the Internet from any location”? we observe the results in Table 3.6.

Table 3.6: Access Internet from any location in a typical month.

Year	Male-headed hhold		Female-headed hhold		Gap M/F	Incr. on prev. year
	Yes	No	Yes	No		
1997	78.7%	21.3%	71.1%	28.9%	7.6pts	–
1998	81.2%	18.8%	73.0%	27.0%	8.2pts	+0.6pts
1999	87.5%	12.5%	81.1%	18.9%	6.4pts	–1.8pts
2000	89.2%	10.8%	84.0%	16.0%	5.2pts	–1.2pts
2001	90.0%	10.0%	85.1%	14.9%	4.9pts	–0.3pts

Clearly, the gap is much smaller for this analysis than for whether households had ever accessed the Internet. The gap narrows from 7.6 points in 1997 to 4.9 points in 2001. For comparison with Dickinson & Ellison's time frame, the 7.6 point gap in 1997 increased to 8.2 in 1998, and dropped again to 6.4 in 1999. However, Bimber (2000) and Reddick (2000, 2001, 2001) consider monthly access as infrequent access, as do some Statistics Canada researchers, and all noted that with respect to disaggregated individualized data, there was very little gender divide to be considered with respect to basic access. Furthermore, it has been acknowledged by several critical Internet observers that the gap for basic access has indeed narrowed somewhat.

Emphasis in the *Plugging In* report is given to economic analysis. The report summarizes and compares the results from income based quartile measurements in the first three HIUS (1997, 1998, 1999). The tone is set right from the beginning of the report, where Dickinson & Ellison cite a section of the 1999 Speech from the Throne:

For Canada to generate jobs, growth, and wealth, it must have a leading knowledge-based economy that creates new ideas and puts them to work for Canadians. To do this, it is essential to connect Canadians to each other, to schools and libraries, to governments, and to the marketplace—so they can build on each other's ideas and share information (Government of Canada, 1999, p. 12) (Dickinson & Ellison, 2000)

Immediately, the tone for the report is set. It suggests that the “diffusion and use [of the Internet] is widely regarded as an indispensable means of future growth and development” (p. 1). This represents a significant difference from how Menzies framed the concept, when she suggested we need a policy to promote:

a conscious cultivation of digital connectivity as a social utility for social cohesion supporting a diverse range of social and cultural as well as economic and political values and objectives. Such a policy would provide a necessary counter to the already

strong market forces pushing connectivity for knowledge production and consumption, and would greatly enhance the goal of social cohesion (Menzies, 1998, p. 18).

The emphasis on economic objectives is reflected in the presentation of the income divide with respect to Internet access. Although *Plugging In* does recognize that there is a large difference in access across income quartiles, income gap analysis performed by this author demonstrates clearly that the gap is not getting any smaller. In fact, it has grown much larger since 1995, as can be seen in Table 3.7.

However, the report claims that:

the difference in penetration rates in the top and bottom quartiles has increased a little since 1998, perhaps suggesting that the inequality in Internet use—the so-called “digital divide” has increased. But inequality in this context is a relative concept and can be analysed in different ways (Dickinson & Ellison, 2000, p. 4).

After essentially dismissing the concept of a digital divide, Dickinson & Ellison point out that the rate of growth in the bottom quartile regarding regular household Internet access from any location has been greater than in the top income quartile. Technically, the bottom quartile increased by close to 50% in two years (12.4% in 1997, to 18.8% in 1999) while the top quartile only increased by about 30% (53.7% in 1997 to 71.2% in 1999) (Ibid, p. 5), so it is true that the growth rate has been higher for the bottom quartile than the top quartile. However, using percentage growth is itself a “relative concept”, dependent entirely on what the initial penetration rate is. For example, if the bottom quartile had a 5% penetration rate in 1997 and a 10% penetration rate in 1999, this would represent a 100% growth rate. If the top quartile was at 60% in 1997 and 90% in 1999, this would represent only a 50% growth rate, but clearly, the penetration rate is much more favourable.

The fact remains that in 1999 the penetration in the bottom quartile was 18.8% for access from any location and 71.2% in the top quartile (Ibid, p. 5). Clearly, there was still a large gap, one that had expanded between surveys, not contracted. As such, Table 3.7 tracks the point change in the gap between the top and bottom quartiles from 1995 to 2002 for in-home access. Point analysis is created by subtracting the percentage of respondents in the bottom quartile who indicated they had in-home access from the percentage of respondents in the top quartile who had in-home access. This provides a gap measurement. It is important to note that there is some variation in variables from the HIFE data to the HIUS data. The 1995 & 1996 HIFE measured whether or not the household had a computer with a modem, thereby inferring available Internet access. The HIUS specifically measured whether or not a household used the Internet from home.

Table 3.7: Income gap analysis for in-home Internet use

Year	All	1st quartile	2nd quartile	3rd quartile	4th quartile	Gap 1st/4th	Incr. over prev. year
1995	12.0%	4.8%	7.3%	13.6%	22.4%	17.6pts	–
1996	15.5%	6.1%	9.8%	16.3%	29.8%	23.7pts	+6.1
1997	16.0%	5.5%	8.9%	17.1%	32.5%	27.0pts	+3.3
1998	22.6%	7.1%	13.7%	24.6%	44.9%	37.8pts	+10.8
1999	28.7%	10.9%	18.0%	32.4%	53.5%	42.6pts	+4.8
2000	40.1%	16.5%	31.2%	47.4%	65.4%	48.9pts	+6.3
2001	48.7%	22.6%	40.0%	56.4%	75.8%	53.2pts	+4.3
2002	51.4%	25.1%	39.9%	62.3%	78.4%	53.3pts	+0.1

1995: Dickinson & Sciadas, 1996, p. 5

1996: Dickinson & Sciadas, 1997, p. 7

1997-2002: Sciadas, 2003, p. 103

When the gap is compared from year to year, it is clear that it is in fact growing. Overall, the gap has grown by 35.7 points from 1995 to 2002. Dickinson & Ellison,

examining only data from 1997 to 1999, suggest we need not be concerned about the slight increase of 4.8 pts from 1998 to 1999 in the gap (2000, p. 4). However, I believe it should be viewed as a continuation of what appears to be an annual trend, and should be taken very seriously. Moreover, Dickinson & Ellison had access to the data from the 1995 and 1996 HIFE surveys. In fact, Dickinson co-authored the corresponding reports. From 1995 to 1999, the years for which Dickinson & Ellison had available data, the gap grew by 25.0 points. However, they make no mention of the continuing trend of an annual increase in the income gap, nor do they even provide the basic analysis I produced. In 2002, Sciadas acknowledges that the income gap remains an issue, with most of the newly generated Internet users emerging from the mid and upper level income quartiles (Sciadas, 2002, p. 17).

It is important to keep in mind that this analysis merely measures Internet accessibility within the home. It does not consider frequency of use in relation to income quartiles, nor does it provide any further insight in to the gender gap. However, these types of gap analyses can also be conducted using disaggregated data from the available 1997-2001 HIUS (the 2002 HIUS is not yet available for public analysis), in order to examine the gender gap with respect to in-home access. The data is disaggregated by selecting only respondents who selected the response "one person household" for the variable measuring family type (see Appendix A). This variable is standard across all datasets.

Using re-coded frequency of use variables, it is possible to examine the different degrees of penetration for men and women with respect to frequency of access and corresponding income quartiles. Each HIUS asks the question "How often to members of

your household use computer communications at home in a typical month?”. Their answers can be re-coded as seen in Table 3.8.

Table 3.8: Frequency of use at home: re-coding structure

1997-1999		2000-2001		New Daily	New Weekly	New monthly or less
Old Values		Old values				
1	min. 7x/wk	1	Daily	1 = yes old val. 1	1= yes old val. 2	1 = yes old val. 3, 4
2	min. 4x/wk	2	Weekly			
3	1-3x/ mth	3	Monthly	0 = no old val. 2, 3, 4	0 = no old val. 1, 3, 4	0 = no old val. 1, 2
4	< 1x/mth	4	Rarely			

In order to test the validity of the disaggregation attempt, a similar analysis is performed on the 2000 GSS. It is again necessary to re-code a usage variable (h) measuring frequency of Internet use at home into three new categories. The process was similar to the process used for the HIUS recoding (see Appendix A). The results of the crosstab using disaggregated, frequency of in-home use by gender analysis, and the crosstab using the 2000 GSS can be observed in Table 3.9.

Beginning with an examination of the HIUS data, it is clear from this analysis that the gap between men and women with respect to daily Internet use at home has grown, except for a small decrease from 1998 to 1999. Overall, the daily use gap has grown 8.9 points between 1997 and 2001. The gap for weekly use has increased at a significantly decreased rate than the gap for daily use, totalling 2.5 points from 1997 to 2001. The monthly use gap has shifted from 1997 to reveal more women than men using the Internet from home on a monthly or less basis. The gap for this usage category has grown by 0.6 points from 1997 to 2001, but is essentially negligible given the very low rate of response for this category. When compared to the 2000 GSS results, we see that the usage gaps are

Table 3.9: Gender disaggregated frequency of use at home analysis, by %

	1997			1998			1999		
	Male (%)	Fem (%)	Gap (pts)	Male (%)	Fem (%)	Gap (pts)	Male (%)	Fem (%)	Gap (pts)
Daily	7.2	2.2	5.0	10.8	3.7	7.1	11.7	5.2	6.5
Weekly	1.8	2.2	-0.4	4.3	2.5	1.6	5.4	3.2	2.2
Mthly/less	0.9	0.6	0.3	0.5	0.5	0.0	0.3	0.3	0.0
	2000			2001			2000 GSS		
	Male (%)	Fem (%)	Gap (pts)	Male (%)	Fem (%)	Gap (pts)	Male (%)	Fem (%)	Gap (%)
Daily	17.3	8.9	8.4	25.1	11.2	13.9	17.3	10.8	6.5
Weekly	7.4	4.6	2.8	8.4	6.3	2.1	13.9	11.4	2.5
Mthly/less	0.7	0.8	-0.1	0.9	1.2	-0.3	8.5	10.6	-2.1

very similar, although the actual penetration rates are higher for the weekly and monthly usage categories (see Table 3.10). It is reassuring to note, for confident comparison, that

Table 3.10: 2000 HIUS and 2000 GSS in-home usage gap comparison

	2000 HIUS			2000 GSS		
	Male (%)	Fem (%)	Gap (pts)	Male (%)	Fem (%)	Gap (%)
Daily	17.3	8.9	8.4	17.3	10.8	6.5
Weekly	7.4	4.6	2.8	13.9	11.4	2.5
Mthly/less	0.7	0.8	-0.1	8.5	10.6	-2.1

the monthly usage gap reveals the same tendency to be dominated by women rather than men.

The difference in actual penetration rates could be explained by the disaggregation process. When the HIUS data is disaggregated, there is an imbalance in the percentage of male and female respondents. The norm is approximately 50% men and 50% women.

The disaggregated HIUS data tends to have a higher percentage of women than men. Furthermore, as has been noted, it is challenging to disaggregate a household survey confidently. As such, the fact that the HIUS gap analysis reveals similar results as the naturally disaggregated 2000 GSS gap analysis provides a degree of confidence in the results. It should be re-iterated at this point that crosstab analysis is used to demonstrate patterns within the data. It does not provide an indication of a causal relationship. For causality indicators, it is necessary to perform regression analysis, and in our case, given the dichotomous dependent variables, logistic regression will be required. Further, more detailed crosstab analysis will be presented in the next chapter, along with logistic regression analyses to determine if gender itself is a significant factor.

Regardless of the difference in penetration rates, this type of variable re-coding and crosstab analysis is generally viewed as standard statistical procedure. Although Dickinson & Sciadas do not re-code any variables in their analyses for the *Plugging In* report, they have performed several crosstab analyses, and likely performed hundreds more that were not published. As such, it is disheartening to witness their decision to neglect any consideration of gender analysis in their publication, or in the majority of Statistics Canada reports published after 1999.

With respect to logistic regression analysis (econometrics), Sciadas indicated that Statistics Canada does not normally produce econometric analysis given the high degree of variability that can be introduced (Sciadas, 2004/05/28). He asserts that Statistics Canada has a reputation of neutrality to maintain and, as such, he believes that basic crosstab analysis is more than sufficient to produce the data required and maintain Statistics Canada's reputation as the national authority. Microdata is available to those

who wish to pursue further avenues of analysis, such as econometrics (Ibid). Sciadas did acknowledge that they conduct econometric analysis in other areas, but that that this data represents a new area of study, and consequently he prefers to restrict analysis to the crosstab level. Again, a more specific request for detailed examinations of access divides and their causes from the federal government would likely have resulted in more in-depth data analysis from Statistics Canada.

Sciadas' comments regarding the unbiased nature of Statistics Canada analyses and reporting are curious in light of the following discussion. In terms of the economic framing issues, there are a few interesting formatting issues in the *Plugging In* report. As one moves through the report, all the data is presented in 7 tables. It is fair to say that on average, when information is presented in a table, the general format is to have some sense of numerical or alphabetical order. For instance, Table 2 of the *Plugging In* report, entitled Internet penetration rates, by location of use and household income (p. 5), presents data according to income quartiles, beginning with the bottom quartile and moving up to the top quartile. Table 3, comparing Internet penetration rates and the education levels of household heads, begins with the category "Less than high school" and moves up to "university degree". Even the geographic comparisons present either provinces or CMA's in a general east coast to west coast pattern. However, the table presenting usage data follows no such guidelines. In fact, it appears that there is no numerological, alphabetical, or categorical organization at all (see Table 3.11)

Other than E-mail being the top use by household, and placed at the top of the list, there appears to be no order to the presentation of this information, other than to prominently highlight e-banking and e-commerce activities, both of which rank well down

Table 3.11: Proportions of households using the Internet from home, by type of use

Use	All Households %				Regular Use Households %			
	Rank	'97	'98	'99	Rank	'97	'98	'99
E-mail	1	13.3	19.3	26.3	1	83.1	85.6	91.7
E-banking	9	3.1	5.5	8.0	9	19.5	24.4	27.7
Online Purchases	12	1.5	2.5	5.5	12	9.2	10.9	19.0
Medical Info	4	—	9.6	15.6	4	—	42.5	54.2
Education/training	8	—	6.8	9.2	8	—	30.0	32.0
Gov't Info	5	—	8.2	12.7	5	—	36.4	44.1
Other Specific Info	2	—	15.3	24.4	2	—	67.9	85.1
General Browse	3	13.5	17.6	24.3	3	84.7	78.1	84.7
Playing Games	6	—	7.8	12.3	6	—	34.4	42.7
Chat Groups	11	—	5.7	7.5	11	—	25.4	26.2
Obtaining Music	10	—	—	7.8	10	—	—	27.1
Listen to Radio	13	—	—	5.0	13	—	—	17.5
Other Services	7	2.2	2.6	10.0	7	13.7	11.6	34.7

— indicates a category of use not asked in that year

Dickinson & Ellison, 1999, p. 4

in the bottom half of the type of use categories, far behind the level of activity of medical/health searches or general and specific information searches. This pattern is repeated in subsequent reports (Sciadas, 2003).

When asked about this pattern, Sciadas indicated initially that the charts were merely presented in the order the questions were asked on the surveys (Sciadas, 2004/05/28). However, as is noted further in this section, Silver presents type of use charts according to ordered type of use percentage. Eventually, Sciadas suggested the list also represented the interests of policy departments at the time. In particular, their client, Industry Canada, was interested in e-banking and e-commerce. Sciadas further suggested

the list would be changing significantly in the future to address users shifting priorities, and place even greater focus on specific e-commerce activities (Ibid).

Following the *Plugging In* report, the next major publication from Statistics Canada documents are based on the 2000 GSS. The first is the summary of the reports published in *The Daily*, March 26, 2001. The second is a presentation of charts and graphs entitled *Overview: Access to and use of Information Communication Technology*. The actual report is entitled *Changing our ways: Why and how Canadians use the Internet*. These three reports follow many of the same patterns seen in the *Plugging In* report. While there is mention of the gender divide with respect to Internet access, the comments can only be categorized as positive and superficial. As noted earlier, Dryburgh presents information suggesting the gender divide is almost even when comparing men and women (Dryburgh, 2001, p.2). But there is no mention in any of the reports regarding frequency of use, nor location of use. Access differences across income quartiles are also included in the report, but the information is for access from any location, and does not include a breakdown comparison of income and various points of access (home/work/school).

There is some contradiction between the three documents with respect to gender information. In its only reference to gender, *The Daily* notes that men use the Internet more than women (Ibid, p. 2). In her report, Dryburgh (2001) notes that not only are men more likely to use the Internet than women, but that the usage gap exists and increases with age (p. 1). However, Dryburgh de-emphasizes her observations with the statement that the gender gap has decreased since 1994, from 8 points in 1994 (men 22%, women 14%) to 6 points (men 56%, women 50%) in 2000. It is true that the gap has decreased; however, it is by a very small amount, and it is, as has been noted previously, measuring

whether or not the respondent had accessed the Internet at least once in the past 12 months from home, work, or school. As noted at the very beginning of this chapter, the media focussed not on Dryburgh's assertions that the gender gap continued to exist, or that it got larger as users got older, but instead focussed on her observation that the overall (undefined usage) gap had decreased from 1994. As a result, the media declared the gender gap essentially eliminated (Brethour, March 27, 2001).

One of the more interesting facets of the three reports for the 2000 GSS is the emphasis of a new measurement not previously collected. The survey included questions asking respondents to indicate if they believed access to the Internet should be universal, and then followed up with a question asking who should be responsible for ensuring universality. The summary in *The Daily* is as follows:

About three-quarters of the population felt that access to the Internet should be universal. However, people differed on who should be responsible for removing the barriers. Of those who had an opinion, about 45% felt the responsibility belonged to individuals themselves, while 42% felt that the federal government should remove the barriers. About 37% indicated that private industry such as Internet service providers should be responsible. Just under one quarter said they did not know who should be responsible for eliminating barriers (The Daily, March 26, 2001, p. 2).

The information is placed prominently in the *The Daily*, presented before any mention of differences of access across income quartiles. It might be suggested that this is an introductory way of continuing to shift the framing of responsibility for universal access issues away from the federal government. It is noted that respondents who tended to allocate responsibility to the federal government for removing access barriers tended to come from the non-user category (Ibid, p. 2).

Furthermore, the impact of the emphasis on e-commerce in the 2000 GSS survey is clearly observed in the reports. Beginning with the *The Daily*, there is an attempt to highlight user's online activities. This time the information chart is presented in numerical order based on usage rates, with searches for goods and services ranking first out of nine categories, with 75% of users participating in this activity. E-banking and actual purchases were ranked 7th and 8th respectively (Ibid, p. 4). However, the corresponding commentary refers almost exclusively to E-banking and online purchasing activities (Ibid, p. 3). Dryburgh's report presents a more balanced overview of how respondents use the Internet, but she too gives priority in her commentary regarding E-banking and online purchasing activities (p. 8). Moreover, the corresponding *Overview: Access to and use of Information Communication Technology* (2001) reverts back to previously observed presentation patterns with respect to usage categories. In a table comparing provinces and usage categories, E-banking and online purchase measurements are placed near the top of the chart, in spite of the fact that they both rank at the bottom of the list, just above newsgroup participation (p. 9).

In general, these three documents do not provide much actual analysis, other than general presentation of data. There was no associated overview report released in conjunction with this survey. It did permit the publication of various articles documenting different access divides, such as urban/rural divides and age divides, but apart from the brief mention the gender divide receives in the three documents discussed here, no further in depth analysis was produced regarding the access gap and gender.

3.6 The tide changes?

We find recognition and detailed analysis of part of the gender divide in an unlikely publication—*Internet Use among Older Canadians* (Silver, 2001). Although Dryburgh (2001) initially acknowledged that the gender gap grows with age, Silver contributes the most comprehensive analysis to date, albeit as a sidebar to her primary focus, the examination of Internet use among older Canadians. It is perhaps significant that Silver works for the Housing, Family and Social Statistics Division of Statistics Canada, while authors like Sciadas, Dickinson, and Ellison all work for the Science, Innovation and Electronic Information Division.

Silver consistently includes measurements contrasting male and female seniors and their Internet use, beginning with the presentation of a chart clearly demonstrating the widening gender gap as the respondents grow older, noting specifically that “among those aged 60 and over, men were twice as likely (17%) as women (9%) to be Internet users” (Ibid, p. 5). She also asserts that the gender divide “sets in early and widens in older age groups” (Ibid). However, on a positive note, her analysis revealed that new user growth is highest amongst seniors, with almost twice as many older women (43%) than older men (25%) taking up the Internet in the 12 months preceding the 2000 GSS. In fact, Silver’s analysis revealed that in every age category, women were outnumbering men as users that had started to use the Internet in the past year (Ibid). Furthermore, Silver examined any differences with respect to frequency and intensity of use. She observed that on a weekly basis, “on average, men under age 60 spent more time on the Internet at home (7.7 hours) than women (5.9 hours)” (Ibid, p. 6). This usage gap decreased for users over 60.

Silver proceeds through several more comparative analyses, including location of use, planned use, purpose and types of use, barriers to use, and demographic indicators (education and income), consistently reporting any observed differences between men and women. This type of documentation is not found in any other Statistics Canada publication. Furthermore, she follows the traditional method of publishing charted information, presenting type of Internet use information in descending order from the most common use to the least common use, broken down by gender, thereby placing results for E-banking and online purchases near the bottom of the chart (Ibid, p. 7).

For our purposes, one of the most important analyses presented by Silver is the logistic regression models she conducted to study the influence of gender, age, income, education and living arrangements. This is similar to the type of information presented by Bimber and Reddick, and is not found anywhere else in Statistics Canada publications. Given her area of study, Silver focussed solely on respondents over 60. She observed that the “odds of women using the Internet were less than three-quarters those of men [and that] this gender effect is independent of age, living arrangements, employment status, income, and education”. This suggests that gender is a factor in and of itself, separate from income. This is similar to what Bimber observed, although he determined that gender was a factor with respect to frequent and moderate Internet use, whereas Silver’s observation is with respect to basic Internet use (access) among respondents over the age of 60. Regardless, her analysis provides support for both Bimber and Reddick’s assertions that gender has some determining influence with respect to Internet use. As such, the question remains as to why Statistics Canada chose not to pursue this avenue of research

given that papers have been published examining age divides, urban/rural divides, and as discussed below, income divides.

In 2002, Sciadas published *Unveiling the Digital Divide*. This publication differs significantly from other Statistics Canada papers in that it focusses exclusively on the income gap with respect to Internet access. Moreover, unlike Dickinson & Ellison (1999) Sciadas does not downplay the existence of the gap, and concludes that the issue remains one of significant concern. Furthermore, Sciadas argues that there are many possible divides of interest, while at the same time, articulating one of the central concerns of this thesis, that “there are serious policy and business reasons why such itemization of groups may matter—and the two may well differ. Connecting rural areas at ‘reasonable’ cost is non-trivial—especially when broadband is concerned” (Sciadas, 2002, p. 5). As has been suggested earlier in this thesis, if Statistics Canada does not discuss any possible gender divide, and in fact summarily dismisses the possibility of its existence based on one broadly interpreted definition of “access”, the federal government can correspondingly refuse to put in place any policy initiatives that would help women get online.

For his part, Sciadas gives passing acknowledgement of the existence of a gender gap with respect to the now standard parameters of having accessed the Internet from home, work, or school in the previous 12 months preceding the 2000 GSS. Other than that, he makes no mention of any further gender divide issues. Curiously, he is using the same dataset as Silver, and performs many of the same comparisons as she did the previous year. Moreover, he is using the respondent’s full age range in the dataset. Regardless, Sciadas does not address gender beyond the brief mention of a basic access divide.

Sciadas does, however, acknowledge that there is no support for the argument “that given a sufficiently long period of time, all technologies will reach saturation. There are technological, economic, behavioural and other barriers at work that may place a ceiling on penetration levels below” (p. 9). It is startling to see this notion published in a Statistics Canada document, particularly in light of the observations by Crompton et al. (2002) a few months earlier, regarding so-called dropouts and non-users. They suggested that:

With younger people using the Internet for an increasing number of purposes, one might expect that they will continue to do so over a lifetime, provided they have easy access. As a younger generation replaces the less interested and computer-savvy older generation, it is probable that the Net will become just as commonplace a communication technology as radio, television and the telephone (p. 5).

Referring back to Shade and Reddick’s fears that the Internet ran the risk of becoming too commonplace within the household (discussed in Chapter 2), Crompton et al.’s enthusiasm should be taken with a grain of salt. Furthermore, their claim that “it is probable” the Internet will become ubiquitous is completely unstatistically unsupported, particularly in light of their earlier observations regarding the growing numbers of non-users. It is possible that the younger generation will pick up some of the slack as they replace their elders, but as Sciadas (2002) notes, as different Information Communication Technologies (ICTs) have been introduced into households (i.e., telephones, televisions, VCR’s etc), they have each demonstrated their own peculiarities with respect to penetration rates, so no assumptions can or should be made about the “probable” future saturation of Internet users based on a comparison to previous ICTs.

Sciadas presents an interpretation of the income gap that is not possible for an outside user to replicate. As noted above, the publicly available datasets for the HIUS only provide income information in pre-determined quartiles or quintiles, unlike the earlier HIFE datasets. Sciadas performed a detailed analysis on penetration gaps between income deciles. He initially observed a growing income gap, but argues this conclusion is subject to further analysis. He further performed an analysis examining the progression of the income gap between deciles from 1996 to 2000. His results indicated that the closer the income groups being observed were, the smaller the relative divide for Internet access penetration (p. 14). Moreover, he observed that the divide closes between several adjacent deciles, and disappears completely between the 4th and 6th deciles in 1999 and 2000 (p. 15). Regardless of this progress, he acknowledges that his analysis is not necessarily suitable for income groups significantly distanced from each other, and that overall:

the relative digital divide is generally closing but this is the result of progress middle-income groups have made (particularly upper-middle) when compared to the highest income group. The lowest income groups (the three bottom deciles) continue to lose ground vis-à-vis the very high income groups (p. 17).

However, after asserting earlier that there is no support for the argument that given time, all technologies will reach saturation, Sciadas mutes this statement with the suggestion that the pattern of Internet penetration he observed across income deciles “is quite consistent with many technologies in their early stages of adoption and [that] it remains true that the [percentage] rate of growth of Internet use at lower incomes is higher than that of the higher incomes” (p. 18). As noted earlier in this thesis in relation to Dickinson & Ellison (2000), the percentage rate of growth is an unreliable indicator for measuring income gap development given that it is entirely dependent on the initial penetration rate.

Sciadas (2002) does provide an outline for what is perhaps the most mathematically confident method for measuring the relative growth of the penetration gap between the bottom and top quartiles. As discussed above, measuring just the percentage rate of growth in each quartile does not provide a useful measure of the income gap:

What happens to the gap depends crucially on the magnitude of the initial mass of connected households, the associated gap in penetration rates by population sub-groups, as well as the respective rates of growth. Higher rates of growth among low-penetration groups may still result in a widening gap (p. 13).

Furthermore, although Reddick performs gap analysis using growth point differential, and the same type of analysis was conducted for this and is presented in Table 3.7 this is still a very basic analytical method. Sciadas presents a methodology for measuring the divide with more mathematical confidence. He suggests that:

the rate of growth of the low-income penetration must be higher than the rate of growth of the high-income penetration by as many times as the ratio of the penetration rate of the high to low income was in the initial period (p. 10).

Simply put, this means that the rate ratio must be larger than the quartile ratio (see Appendix A). Sciadas' methodology was applied to a gap analysis of the data presented in Table 3.7, with the result indicating that the gap between the bottom and top income quartiles is still growing, although the rate of growth appears to be slowing (see Table 3.12). By 2001, the rate ratio is almost equal to the quartile ratio, suggesting that the gap for 2001-2002 remained the same size. However, it is important to note that we have yet to observe a decrease in the original gap, just a slowing down of its incremental growth. An analogy would be the deficit. Eliminating the deficit still leaves one with the initial debt load to address.

Table 3.12: Income quartile gap analysis, by rate ratio

Year	Bottom quartile	Rate of increase	Top quartile	Rate of increase	Quartile ratio	Rate ratio
1995	4.80%	—	22.4%	—	—	—
1996	6.10%	+27.1%	29.8%	+33.0%	4.67	0.82
1997	5.50%	-9.8%	32.5%	+9.1%	4.89	-1.08
1998	7.10%	+29.1%	44.9%	+38.2%	5.91	0.76
1999	10.9%	+53.5%	53.5%	+19.2%	6.32	2.79
2000	16.5%	+51.4%	65.4%	+22.2%	4.91	2.32
2001	22.6%	+37.0%	75.8%	+15.9%	3.96	2.33
2002	25.1%	+11.1%	78.4%	+3.4%	3.35	3.26

See Section A.4 in Appendix A.

Table 3.13: Gender disaggregated daily in-home use gap analysis, by rate ratio

Year	Female	Rate of increase	Male	Rate of increase	Quartile ratio	Rate ratio
1997	2.2%	—	7.20%	—	—	—
1998	3.7%	+68.2%	10.8%	+50.8%	3.27	1.34
1999	5.2%	+40.5%	11.7%	+8.33%	2.92	4.86
2000	8.9%	+71.2%	17.3%	+47.9%	2.25	1.48
2001	11.2%	+25.8%	25.1%	+45.1%	1.94	0.57

Similar analysis can be performed on the gender divide information derived earlier in this thesis (Table 3.9). Given the relatively low penetration rates for weekly and monthly or less usage patterns, this rate ratio analysis will focus exclusively on daily in-home use. The results, (see Table 3.13) provide support for previous observations that gender gap is, in fact, continuing to grow. There is a notable reversal between 1998 and 1999, with the gap diminishing, but on the whole, it continues to increase.

These two reports, Silver (2001) and Sciadas (2002), present the most balanced interpretation of the HIUS and GSS data to date. However, this pattern is not continued within Statistics Canada. In 2003, Sciadas edited and released two major reports. The first, *Canada's Journey to an Information Society* (2003), was for Statistics Canada and represents a major overview of the Information Communication Technology industry in Canada. The second, also edited by Sciadas, entitled *Monitoring the Digital Divide...and Beyond* (2003) was published for Orbicom International Secretariat, an international communications research group created in 1994 by UNESCO and Université du Québec à Montréal.

Sciadas' Statistics Canada document is very similar to the previous documents we have discussed, only on a much larger scale. This 250 page document is predominantly focussed on the ICT industry itself, and specifically on the E-commerce industry. For our purposes, it is not necessary to provide a detailed overview of this document. However, there are few points that should be highlighted. As you recall, IHAC, the CRTC, and the Federal Access strategy all placed significant emphasis on the importance of creating a competitive environment reliant on market forces as opposed to government regulation. Sciadas notes that among ISPs in Canada, the most frequently cited impediment to growth in the industry is competition, or, to put it in clearer terms, the monopolistic practices and closed network strategies of the companies who own the infrastructure. In fact:

The number of access providers has shrunk and large players such as telecommunications and cable companies have entered the market creating an environment of intense competition and a battle for subscribers. One of the strategies that has been used to lure subscribers from competitors is pricing services *at or near* the cost of providing these services. This is one reason that the industry continues to post operating losses, and helps explain why ISP's rate competition as their chief impediment to growth (p. 69).

Furthermore, many of the smaller and medium sized ISPs do not own any of the actual infrastructure (dial-up access servers and switches) for providing Internet service, and are dependent on another ISP to deliver them access service which the smaller ISP then resells to their customers. Sciadas' analyses revealed that "more than half of all medium-size firms reported delays in obtaining facilities from telephone or cable companies as a high impediment" (p. 70) to growth. The cable and telephone companies have been directed by the CRTC to provide access to their infrastructure for smaller ISP companies to act as resellers. According to Sciadas' analysis, this has yet to become an easy negotiation for small and medium size ISP companies.

It has been noted earlier in this chapter that the HIUS surveys fail to meet the criteria set out by the CRTC and IHAC with respect to monitoring Internet usage in remote and rural areas, given that these surveys are piggybacked on the Labour Force Surveys which do not include residents of the Yukon, Northwest Territories, or Nunavut, persons living on Indian reserves, full time members of the Canadian Armed Forces and inmates of institutions. However, Sciadas notes that beginning in 2001, the Aboriginal Peoples Survey (APS) included questions designed to collect information on Internet access and usage parameters. Specifically:

the questionnaire asked respondents about the use of selected ICTs, including satellite, cable, cellular phones, computers and the Internet. The location of computer and Internet use by Aboriginal peoples was also of interest, whether from home, work, school, library, home of friend/relative, or community centre (p. 92).

Data was collected from 120,000 respondents over the eight month period from October 2001 to June 2002. Respondents included Aboriginal individuals living on reserves, Metis settlements, Inuit communities and urban and rural centers. This survey

would be very useful to help Statistics Canada meet the parameters set forth by IHAC and the CRTC for measuring Internet access. However, Sciadas notes that as of December 2003, no analysis had yet been published from the APS (p. 92). Furthermore, it is problematic that this information is collected separately from the HIUS surveys. The APS will provide a one-time glimpse of Aboriginal Internet activities, and the survey data cannot be incorporated into the HIUS datasets. It is hoped that the APS survey designers consulted the HIUS and 2000 GSS survey designers to ensure that at least some basic comparisons can be made between the two datasets, in a manner similar to how comparisons can be made between the HIUS and the 2000 GSS.

Overall, the *Canada's Journey to an Information Society* does not provide much in the way of new information for our purposes, although it is interesting to observe the volume of information presented regarding the ICT industry, employment in the ICT industry, and E-commerce activities in both household and business environments as compared to the amount of information presented regarding how Canadians actually use the Internet. Of the 250 pages in the document, only 40 pages present analysis discussing how Canadians actually use the Internet.

The same criticisms levelled towards *Canada's Journey to an Information Society* cannot be said of Sciadas' other recent major publication. The report he edited for Orbicom, entitled *Monitoring the Digital Divide...and Beyond* presents an entirely new framework for measuring the digital divide. Although this new methodology is designed primarily to examine the digital divide between countries, his methodology presents some very interesting possibilities for measuring the digital divide within countries as well. Specifically, the methodology attempts to offer:

a global set of indicators (infostate) showing how the availability of ICT's and access to networks can be a misleading indicator if it neglects people skills, and if ICT networks and skills combined (infodensity) are not matched by a measurement of what individuals, businesses, and countries actually do with such technologies (info-use) (p. vii).

Specifically, infodensity refers to the sum of all ICT stocks in a country, info-use refers to the consumption of flows of ICT's, and the resulting info-state is an aggregation of infodensity and Info-use (p. 6). What is particularly useful for our purposes is the breakdown of variables provided for use to measure infodensity and info-use. It is important to keep in mind that this model is designed for cross-country comparison, but it might be modified to adapt to the constraints of single country comparison, specifically comparing income quartiles.

With respect to infodensity, Sciadas suggests that "networks are a major contributor to the Digital Divide between haves and have-nots" (p. 34). In order to measure networks, he suggests examining the following indicators: main telephone lines, waiting lines (for a main telephone line), digital mainlines, cell phone subscriptions, cable connections, Internet hosts, secure servers, and international bandwidth (p. 123). He also argues that an examination of skill indicators falls under the aegis of infodensity. However, he notes that these skill indicators are quite general in order to be quantifiable in less connected countries: literacy rate, gross enrollment ratio (primary, secondary, tertiary). He suggests that as more countries become connected, the skill indicators can become more specific and more ICT oriented. Furthermore, he recognizes that this is "an area where serious improvements must be sought by the international community" (p. 126).

Sciadas also provides a detailed methodology for examining Info-use in a country, breaking the category into two main categories: ICT uptake and ICT intensity of use. Indicators for ICT uptake include: television equipped households per 100 households, residential phone lines per 100 households, PCs per 100, Internet users per 100 (p. 126). Intensity of use would be monitored: number of broadband users, international outgoing telephone traffic per capita, and international incoming telephone traffic per capita.

It may be possible to apply these indicators to measure a digital divide based on income within Canada. Clearly, there is no one specific survey already in existence that would provide all the variables required for analysis according to Sciadas' new methodology, and as such, compiling the information would be quite time consuming, and would also be subject to variability due to the fact that the data would include different respondents from several surveys. However, given Sciadas' (and Orbicom's) enthusiasm for this new methodology, and the scope of data available to staff of Statistics Canada (that is not necessarily available for free public use), it is hoped that an attempt to apply this methodology to Canadian data will be undertaken in the future. It is unclear if such an analysis would be able to specifically separate out women and men for separate consideration, but given the previously mentioned recognized link between income status and gender, an inference could be drawn to any possible gender divide using this methodology.

Sciadas indicated that he believed it would be possible to conduct an analysis of info-use in Canada with an intent to examine internal country divides, specifically along income quartiles, but that infodensity would be essentially impossible to examine (Sciadas, 2004/05/28). The problem, as he sees it, is that infodensity is a measurement of

the total capital and labour skills in a country, and would include such statistics as business ownership and use of computers, and manufacturing information, making it very difficult to break the concept down. However, for the next phase of the Orbicom study, he would like to undertake a comparison of countries that, on the surface, appear to be equally ranked according to their infostate, and determine if one of the other has more extremes internally. It is here that he anticipates a significant analysis of gender divides will come into play (Ibid).

3.7 Conclusion

From the discussion and analyses presented in this chapter, it is possible to confidently challenge Dickinson and Ellison's assertions that the digital divide with respect to income is minor, and decreasing. Not only does basic point gap analysis reveal the gap is increasing, using Sciadas' own rate ratio analysis methodology provides support. The same can be said regarding gender divide. These preliminary disaggregated analyses have clearly demonstrated a statistically significant gender divide with respect to frequency of accessing the Internet, particularly from home. The following chapter will present a much more detailed analysis, including both crosstab and regression analysis.

Overall, the reports generated through Statistics Canada follow the pattern established in the first chapter. There are consistently weak measurements of access presented, in particular, very broad definitions of what constitutes access. To be fair, the reports do present a significant analysis and discussion of the income divide in Canada, but it was not until Sciadas' 2002 report *Unveiling the Digital Divide* that any real acknowledgement of the income divide was reported.

Chapter 4

Data Analysis

4.1 Introduction

The purpose of this chapter is to use the publicly available datasets to perform some of the data analysis as discussed in the previous chapter, as an extension of the work produced by Bimber, Reddick and Silver. It is anticipated that these analyses will build upon the ones presented in Chapter 2 to provide support for the hypothesis that there exists an unexamined gender gap with respect to Internet access in Canada. Crosstab analyses will be presented first, followed by logistic regression analysis. Crosstab analysis provides an indication of a pattern or relationship in the data, but cannot be used to demonstrate any actual causal relationship between the variables. Regression analysis is used to determine if there is a causal relationship between the variables in the dataset, and provides a measure of significance (or confidence). If the analysis is significant, it means

that the causal relationship observed is not due to chance, and can be confidently applied beyond the confines of the survey respondents to the general population. Logistic regression is used when there are dichotomous dependent variables, i.e., if the only available responses permitted are “yes” or “no”. Logistic regression documents a slightly different form of causal relationship information in that it provides a prediction of the odds of one group being associated with the dependent variables over another group.

Clearly, there are some constraints on what can be tested in this thesis given that the datasets available from Statistics Canada do not correspond exactly to the variables used by both Bimber and Reddick. For example, Bimber examined frequent, moderate and infrequent (daily, weekly, monthly or less) Internet use from any location. It is not possible to derive this variable confidently in the HIUS or 2000 GSS datasets. However, this analysis can go one step further than Bimber and examine frequent, moderate, and infrequent use from specific locations, i.e., home, work or school. As such, in Chapter 3, I presented a crosstab analysis measuring male and female frequency of Internet use at home across 1997 to 2001 (see Table 3.9). Unfortunately, it is not possible to present a time-series analysis of frequency of work and school use because the HIUS surveys do not provide any such variables.

However, the 2000 GSS survey does permit the necessary recoding and, as such, it is possible to do a frequency comparison of male and female use of the Internet from different locations, but only for 2000. A similar problem exists with respect to logistic regression analysis. It will be possible to replicate Bimber and Reddick’s use of logistic regression and apply it to the 1997-2001 analysis of frequency of in-home use based on gender, but it will not be possible to provide a logistic regression analysis of frequency of

use from any location. Again, the 2000 GSS will be used to perform logistic regression measuring frequency of access from various locations. While it is not possible to replicate exactly the research conducted by Bimber and Reddick, this more detailed analysis will provide far more specific information, and if a frequency of usage pattern is observed across all locations (home, work, school, and other), then it can be inferred that the crosstab and regression analyses would have shown similar results had a general “any location” variable been available.

Furthermore, neither Bimber nor Reddick performed logistic regression on time-series datasets. Bimber had access to datasets covering three separate survey years, but only performed logistic analysis on the data for 1999. Therefore, the time-series logistic regression analysis can be viewed as an extension of Bimber’s observations. Moreover, the 2000 GSS is a disaggregated survey requiring minimal manipulation to prepare the data for a gender comparison of frequency of use from various locations. This makes it a valuable survey for confidence in logistic regression analysis (which is far more mathematically complicated than crosstab analysis). This mathematical confidence provides a counterbalance to the drawback of the survey being a one-time survey that does not allow for a time-series analysis.

It must be noted again that crosstab analysis is considered as one of the mainstays of data analysis. For instance, when poll results are published (i.e., 54% of women and 46% of men in Canada prefer dogs to cats), they have been derived through crosstab analysis. As such, the analyses performed in this chapter should be considered well within standard operating procedure for Statistics Canada. Logistic regression analyses are less commonly performed, but are still considered routine. Again, they are a form of

regression analysis used when there is a specific style of variable. Regression analysis in and of itself is very routinely performed in data analysis.

4.2 Crosstab Analyses

Given the consistent and statistically demonstrated link between income and gender, the following table presents the results of a crosstab analysis on the income quartile and gender variables for the disaggregated 1997-2001 HIUS (see Table 4.1). The results reveal the expected relationship between income and gender. Women are consistently overrepresented in the bottom quartile while men are overrepresented in the top two quartiles. The second quartile reveals a more balanced comparison, but in 2000 and 2001, we see a greater proportion of men, and a corresponding decrease of men in the bottom quartile.

Table 4.1: Gender and Income Quartile Crosstab

	1st Quartile		2nd Quartile		3rd Quartile		4th Quartile	
	M	F	M	F	M	F	M	F
1997	42.5%	55.9%	25.7%	26.3%	22.0%	14.0%	9.8%	3.8%
1998	38.8%	56.0%	27.8%	27.6%	23.8%	12.7%	9.5%	3.7%
1999	41.1%	54.2%	28.4%	29.4%	20.9%	13.2%	9.7%	3.2%
2000	35.5%	56.4%	31.4%	25.5%	24.1%	11.5%	9.0%	6.5%
2001	37.9%	58.5%	30.0%	24.2%	22.4%	13.2%	9.8%	4.1%

Building on the crosstab analysis presented in Table 3.9 demonstrating the relationship between gender and frequency of access from home from 1997 to 2001, the following crosstab (Table 4.2) reveals that a similar relationship is present in comparing gender and frequency of access from various specific locations using the 2000 GSS. As

noted earlier, it is not possible to do a specific location comparison across several years because only the 2000 GSS provides variables specific enough.

Table 4.2: Crosstab gender vs. frequency of use from various locations—2000 GSS

Gender vs.	Male	Female	Gap (pts)
Daily in-home use	17.3%	10.8%	6.5
Weekly in-home use	13.9%	11.4%	2.5
Monthly/less in-home use	8.5%	10.6%	-2.1
Daily work use	10.9%	6.3%	4.6
Weekly work use	4.6%	3.7%	0.9
Monthly/less work use	15.3%	15.2%	0.1
Daily school use	1.6%	1.1%	0.5
Weekly school use	2.4%	2.1%	0.3
Monthly or less school use	5.8%	5.7%	0.1
Daily other locations use	0.5%	0.3%	0.2
Weekly other locations use	2.4%	2.0%	0.4
Monthly/less other locations use	20.6%	15.5%	5.1

This crosstab demonstrates that there is a pattern of higher daily use among men than women from various locations, not just from home. However, as is clear from an examination of the different gaps, the main gaps are for daily in-home use and work use. The gaps for school and other location use are negligible, with the exception of monthly or less use from other locations. It might be suggested that the monthly or less users from other locations are respondents who access the Internet at a friend's house on occasion, or at a public access terminal in a library, etc.

4.3 Logistic Regression Analyses

There will be four main logistic regression analyses presented in this section. The first two will examine only the question the gender and frequency of access. The first will present the results from an analysis of the 2000 GSS measuring access from various locations and various frequencies, while the second will present the results from a time series analysis using HIUS data, focussing specifically on frequency of access from home. The third and fourth will incorporate other demographic variables into the test in order to determine the relative effect of gender. Drawing from Bimber, Reddick and Silver, it is hypothesized that gender will remain a significant factor in and of itself. Based on the previous crosstab analyses, it further hypothesized that gender will remain a predictive variable with respect to daily, weekly and monthly or less in-home and work uses, but will diminish in strength for school and other locations use. However, overall, it is anticipated that age, education level, and income will all be stronger predictors of daily Internet access than gender.

If you recall, with respect to frequent (daily) access, Bimber observed that gender was a significant determinant of access, predicting that more men than women access the Internet from any location on a daily basis. However, he also determined that education, race, and employment status were very slightly stronger with respect to predicting access. Bimber further observed that gender was the only variable to reach significance with respect to moderate (weekly) access from any location. His results revealed that women were more likely than men to be moderate Internet users from any location (see Table 3.1). It is important to recognize that Bimber's analysis presents some obstacles. It is unlikely that income is not a predictive factor, but in Bimber's analysis, income only reached

significance with respect to basic access, not for frequent or moderate access. Therefore, it must be reiterated that Bimber, Reddick, and Silver are being used as guidelines to direct the data analysis.

In particular, Reddick's subsequent analyses present cause for concern. After examining the predictive nature of age, gender, income and education, Reddick performed logistic regressions incorporating six attitudinal factor variables, derived (through factor analysis) from 83 different variables. His results revealed that only income and age maintained significance as predictors. It is of some concern for the analyses presented in this chapter that Reddick observed no predictive characteristics of gender after including his attitudinal variables. However, it can again be noted that Reddick and Silver define access very broadly, whereas Bimber narrows it down to frequency of access.

Reddick observed that gender was a significant variable in predicting Internet use over a three month period in 1997/1998, but noted that it was not as strong a predictor as income, or education (Reddick, 2000, p. 38). Silver observed that "the odds of women [over 60] using the Internet (in the last 12 months from any location) were less than three-quarters those of men" (Silver, 2001, pg. 11). However, for seniors over 60, gender was not the strongest predictor. Education level was by far the strongest predictors, followed by income. (Ibid).

Given Bimber, Reddick's and Silver's observations, it is reasonable to hypothesize that gender will remain a significant predictor of Internet access in some form. However, it must again be noted that it is not possible to replicate their regression conditions exactly. The logistic regressions presented in this chapter are location specific, and will use differently characterized demographic variables.

4.3.1 2000 GSS gender vs. frequency of use from various locations

Table 4.3: 2000 GSS Logistic Regression—gender v. frequency of access by location

	Exp (B)	Sig.		Exp (B)	Sig
Daily in-home	1.80	0.00***	Daily School	1.65	0.00***
Weekly in-home	1.28	0.00***	Weekly School	1.18	0.08*
Mthly/less in-home	0.83	0.00***	Mthly/less School	1.12	0.07*
Daily Work	1.73	0.00***	Daily Other	1.51	0.06*
Weekly Work	1.26	0.00***	Weekly Other	1.24	0.02**
Mthly/less Work	1.01	0.85	Mthly/less Other	1.44	0.00***

*** significant < 0.01; ** significant < 0.05; * significant < 0.1

These results reveal partially similar results as Bimber. Whereas Bimber observed that more women than men used the Internet on a weekly basis from home, work, or school, but more men than women used the Internet on a daily basis, these results reveal that being male predicts greater Internet use from various individual locations across all frequency categories. Only for monthly or less use from work is gender a non-significant predictor. It can be noted that the magnitude of the results for daily use is similar to results observed by Bimber. He noted that 38% of men and 25% of women reported daily use of the Internet from home, work, or school. This result did achieve statistical significance, and can be converted to an Exp (B) of 1.84 (see Appendix A). For moderate use, he noted that women outnumbered men 40% to 28%. This converts into an Exp (B) of 0.58. These results can be compared to a derived geometric mean for daily and moderate use from just home, work, and school from Table 4.3. The geometric mean of Exp (B) for daily use

from home, work or school for the analysis conducted above is 1.74, while the Exp (B) for moderate use is 1.24 (see Appendix A) Clearly, the results are similar to Bimber for daily use, but completely reversed for moderate use.

4.3.2 1997-2001 HIUS gender vs. frequency of use from home

Table 4.4: 97-01 HIUS Logistic Regression—gender v. frequency of in-home access

	Daily		Weekly		Mthly or less	
	Exp. (B)	Sig.	Exp. (B)	Sig.	Exp. (B)	Sig.
1997	2.60	0.00***	2.18	0.00***	2.01	0.00***
1998	2.83	0.00***	1.78	0.00***	1.05	0.87
1999	3.83	0.01***	1.77	0.08*	1.43	0.17
2000	2.12	0.00***	1.79	0.00***	1.10	0.76
2001	2.40	0.00***	1.42	0.00***	0.89	0.62

*** significant < 0.01; ** significant < 0.05; * significant < 0.1

This logistic regression provides further support for the predictive nature of gender with respect to Internet access, particularly when considering daily access from home. Across every year, men are at least twice as likely to access the Internet from home on a daily basis, a result that achieves significance. Furthermore, the odds of men accessing the Internet from home on a daily basis have not stabilized into a pattern across the years, unlike weekly access. Since 1997, there has been a decrease in the odds for men as compared to women, from being twice as likely to access the Internet on a weekly basis in 1997, to being 50% more likely in 2001. The same pattern is not visible in the daily odds results. Regarding the monthly or less category, no result since 1997 has achieved

significance, and therefore cannot be considered reliable for application to the general public.

4.3.3 2000 GSS demographic variables vs. frequency of use from various locations

Table 4.5 shows that gender is still a significant predictive variable, but income is much stronger. This is because the Exp (B) gives the expected odds of one group having access over another. The results are applied as you move up through the variable responses. Gender is a dichotomous independent variable, therefore, there are only two responses. In this case, the variable is coded for responses as follows: 0 = female, 1 = male. For in-home use, the significant Exp (B) for gender is 1.67. Therefore, men are almost 1.7 times more likely to access the Internet from home on a daily basis than women. However, with respect to daily access from home, the Exp (B) for income is significantly reported as $\text{Exp (B)} = 1.11$. This variable has 12 income categories, and the Exp (B) means that as you move up through the income variable responses, the predicted odds of each group accessing the Internet on a daily basis from home is 1.11 times greater than the previous group. Thus, the odds of the top income category accessing the Internet from home on a daily basis compared to the bottom income category is actually $\text{Exp (B)} = 3.15$ (see Appendix A). When this type of comparison is taken into consideration, it becomes clear that income, and high income in particular, is a much stronger predictive variable than gender (Table 4.6).

The same observations hold true for the age category and the education category. The age variable is categorized into seven groupings, with the predicted odds of an older group category having daily in-home Internet access compared to the age group category

Table 4.5: 2000 GSS Logistic Regression—demographic variables v. frequency of access from various locations

	Age		Education		Income		Gender	
	Exp (B)	Sig	Exp (B)	Sig	Exp. (B)	Sig	Exp (B)	Sig
Home								
Daily	0.77	0.00***	0.74	0.00***	1.11	0.00***	1.67	0.00***
Weekly	0.78	0.00***	0.79	0.00***	1.21	0.00***	1.11	0.03**
Mthly/less	0.87	0.00***	0.86	0.00***	1.30	0.00***	0.62	0.00***
Work								
Daily	0.75	0.00***	0.54	0.00***	1.28	0.00***	1.58	0.00***
Weekly	0.80	0.00***	0.58	0.00***	1.23	0.00***	1.03	0.65
Mthly/less	0.72	0.00***	0.76	0.00***	1.22	0.00***	0.81	0.00***
School								
Daily	0.27	0.00***	0.77	0.00***	0.91	0.01***	2.14	0.01***
Weekly	0.24	0.00***	0.85	0.01***	0.87	0.00***	1.19	0.18
Mthly/less	0.34	0.00***	0.91	0.01***	1.01	0.51	1.08	0.33
Other								
Daily	0.66	0.00***	0.73	0.01***	0.91	0.06*	1.48	0.15
Weekly	0.49	0.00***	0.87	0.01***	0.97	0.12	1.24	0.06*
Mthly/less	0.53	0.00***	0.76	0.00***	1.01	0.64	1.47	0.00***

*** significant < 0.01; ** significant < 0.05; * significant < 0.1

immediately preceding only 0.77. The predicted odds for the oldest age group category having daily in-home Internet access compared to the youngest age is 0.21 (Table 4.6). Education is also a strong predictor. For the 2000 GSS, the education variable is coded into five categories, with the first category encompassing respondents who indicate they have attained a doctorate/masters or bachelors degree. The education levels decrease

down to “some secondary/elementary/no schooling”. The predicted odds of a lower education level category having daily Internet access from home compared to the higher education level group immediately preceding are 0.74. However, the predicted odds of the lowest education level category having Internet access as compared to the highest education level category are 0.30 (Table 4.6).

Table 4.6: 2000 GSS—Top category to bottom category Exp (B) comparison for daily in-home Internet use

Age	Education	Income	Gender
0.21	0.30	3.15	1.67

To put this in simpler terms, it is possible to normalize all the Exp. (B) to provide a simpler comparison of likelihood of access (see Appendix A). By converting the age and education Exp (B) for top category to bottom category comparisons, this essentially recodes those two variables so that they are in alignment with Income and Gender. Therefore, for each demographic variable, as you move up a category in the variable, one is more likely to have access to the Internet from home on a daily basis (see Table 4.7).

Table 4.7: 2000 GSS—Converted Exp (B) top category to bottom category comparison for daily in-home Internet use

Converted Age	Converted Education	Income	Gender
4.76	3.30	3.15	1.67

Similar patterns can be observed across the four demographic categories for Internet use work, school, and other locations. However, it should be noted that, overall, these logistic regressions do not correspond with Bimber. As noted earlier, he determined that gender was a significant predictive variable in the weekly use category, with the

predictive odds revealing that women were more likely than men to be weekly Internet users. These results still place the predictive odds in favour of men being more likely to be weekly Internet users, but the odds are much smaller than for daily use. Even taken across home, work, and school (the same locations Bimber used), the derived geometric mean for weekly use from the 2000 GSS—Exp (B) is 1.11. This still places the odds in favour of men. Moreover, Bimber's observations revealed that of all the demographic variables he measured, only gender attained significance with respect to weekly Internet use. This is not the case for the 2000 GSS data. This could be due to variance with the datasets—Bimber's was much smaller, with the population surveyed over a smaller time period. Data for the 2000 GSS was collected over a 12 month period, with a certain number of respondents being contacted each month.

On a positive note, Bimber's results did not demonstrate that the odds of women accessing the Internet on a weekly basis were much greater than men (Std (B) = 0.11, derived Exp (B) = 1.11) (Bimber, 2000, p. 873) (see Appendix A). Given that the derived geometric mean observed in the 2000 GSS dataset was (Exp (B) = 1.11) predicting the odds of men accessing the Internet on a weekly basis as compared to women, the two measurements are not far apart. Both essentially predict that either men or women are 1.11 times more likely to access the Internet on a weekly basis from home, work, or school. This is not a great difference in access rates. However, in the end, Bimber and the 2000 GSS do reveal opposing results.

In general, it has been confidently demonstrated that with respect to the 2000 GSS data, gender is a significant predictive factor with respect to Internet use. It is true that it is not as strong as some other demographic variables, but it is by no means a minor factor.

4.3.4 1997-2001 HIUS demographic variables vs. frequency of use from home

The following tables (Table 4.8 through Table 4.12) present the same type of logistic regression analyses as the one performed using the 2000 GSS data. However, these ones measure strictly Internet use from home, using the disaggregated HIUS datasets for 1997-2001. There are a few key differences. The HIUS income variable only provides quartiles. It was not possible to break down the 2000 GSS income variable from its 12 categories into quartiles, and Statistics Canada did not release a quartile variable in the public use dataset. Therefore, the information provided for the predictive odds of income from the HIUS datasets is not as specific as the information from the 2000 GSS datasets. When a comparison is provided for the odds of the top income quartile compared to the bottom income quartile in the HIUS data, it would be approximately similar to the odds of the top two income deciles having Internet access compared to the bottom two deciles in the 2000 GSS dataset—a piece of information that is not possible to provide. It should be further noted for comparison purposes that the education variable in the HIUS is coded into three categories, and opposite from the 2000 GSS dataset. As such, the first education level category for the HIUS datasets is less than high school, whereas the first education level category in the 2000 GSS is doctorate, masters, or bachelors degree. This will not affect the overall interpretation of data, just provide an opposite result for semantic purposes.

It is again clear that gender remains a factor across all years as a significant predictive variable. Moreover, the predicted odds of men having daily Internet access compared to women does not decrease consistently over the years, and has in fact

Table 4.8: 1997 HIUS demographic variables vs. in-home use

	Age		Education		Income Quartile		Gender	
	Exp (B)	Sig	Exp (B)	Sig	Exp (B)	Sig	Exp (B)	Sig
Daily	0.74	0.00***	2.60	0.00***	1.56	0.00***	1.61	0.00***
Weekly	0.69	0.00***	2.17	0.00***	1.69	0.00***	1.24	0.01***
Monthly	0.73	0.00***	1.60	0.00***	1.56	0.00***	1.22	0.26

*** significant < 0.01; ** significant < 0.05; * significant < 0.1

Table 4.9: 1998 HIUS demographic variables vs. in-home use

	Age		Education		Income Quartile		Gender	
	Exp (B)	Sig	Exp (B)	Sig	Exp (B)	Sig	Exp (B)	Sig
Daily	0.53	0.00***	2.73	0.00***	1.55	0.00***	1.78	0.00***
Weekly	0.60	0.00***	2.37	0.00***	1.66	0.00***	1.08	0.00***
Monthly	0.62	0.01**	1.65	0.06*	1.44	0.03**	0.67	0.21

*** significant < 0.01; ** significant < 0.05; * significant < 0.1

Table 4.10: 1999 HIUS demographic variables vs. in-home use

	Age		Education		Income Quartile		Gender	
	Exp (B)	Sig	Exp (B)	Sig	Exp (B)	Sig	Exp (B)	Sig
Daily	0.63	0.00***	2.80	0.00***	1.40	0.00***	1.59	0.00***
Weekly	0.55	0.00***	1.79	0.00***	1.72	0.00***	0.94	0.60
Monthly	0.84	0.31	1.72	0.07**	1.48	0.05**	0.60	0.19

*** significant < 0.01; ** significant < 0.05; * significant < 0.1

Table 4.11: 2000 HIUS demographic variables vs. in-home use

	Age		Education		Income Quartile		Gender	
	Exp (B)	Sig	Exp (B)	Sig	Exp (B)	Sig	Exp (B)	Sig
Daily	0.54	0.00***	2.50	0.00***	1.31	0.00***	1.31	0.01***
Weekly	0.66	0.00***	2.26	0.00***	1.61	0.00***	1.11	0.34
Monthly	0.75	0.05**	2.24	0.01***	1.25	0.16	0.78	0.42

*** significant < 0.01; ** significant < 0.05; * significant < 0.1

Table 4.12: 2001 HIUS demographic variables vs. in-home use

	Age		Education		Income Quartile		Gender	
	Exp (B)	Sig	Exp (B)	Sig	Exp (B)	Sig	Exp (B)	Sig
Daily	0.58	0.00***	2.52	0.00***	1.19	0.00***	1.63	0.00***
Weekly	0.70	0.00***	1.96	0.00***	1.61	0.00***	0.87	0.17
Monthly	0.74	0.01***	1.73	0.01***	1.60	0.00***	0.56	0.02**

*** significant < 0.01; ** significant < 0.05; * significant < 0.1

increased between 2000 and 2001. It is important to note that gender does not consistently attain significance with respect to weekly and monthly or less use. This could be due to the disaggregation process, given that this dramatically reduces the number of cases included in each regression. Each of the other three demographic variables also have some cases that do not achieve significance, but it remains true that it occurs more frequently to gender. This, again, makes it difficult to demonstrate support for Bimber's observations regarding weekly access, but does provide support for the general hypothesis of this thesis that it is more important to consider frequency of use rather than merely basic Internet access.

With respect to age, education and income, a comparison of the higher variable categories to the bottom variable categories reveals that, with respect to daily Internet use, education is the strongest predictor. In this case, education has only three categories (and is coded opposite from the 2000 GSS education variable), income is presented in 4 quartile categories, and age is presented in 4 categories.

Table 4.13: 1997-2001 HIUS—derived Exp (B) comparing top category to bottom category for daily Internet use from home

	Age	Converted Age	Education	Income	Gender
1997	0.41	2.43	6.76	3.79	1.61
1998	0.14	7.14	7.45	3.72	1.78
1999	0.25	4.00	7.84	5.08	1.59
2000	0.15	6.67	6.25	2.24	1.31
2000 GSS	0.21	4.76cvrt	3.30cvrtd	3.15	1.67
2001	0.19	5.26	6.35	1.69	1.63

The derived geometric mean of the top income quartile as a predictor of daily Internet use compared to the bottom income quartile for the 1997-2001 HIUS datasets is $\text{Exp (B)} = 3.07$, very close to the results observed in 2000 GSS for a comparison between the top and bottom income categories $\text{Exp (B)} = 3.15$.

4.4 Conclusion

The analyses presented reveal quite clearly that gender, in and of itself, does have some determining influence with respect to Internet access, particularly with respect to daily access. It is true that income, education, and age are all stronger predictors of access, but gender presents strong enough results that it should not be ignored. However,

with the exception of Silver (2001), they are not included in Statistics Canada publications. Furthermore, the logistic regression analyses presented above confirm the strong influence of income with respect to Internet access, and as noted earlier, gender and income have long been linked, with women consistently earning less than men.

Chapter 5

Conclusion

As stated in the Introduction, the purpose of this thesis was to consider how Internet access and the digital divide in Canada are defined and framed, using the foundation documents published through the federal government and subsequent policy initiatives, and statistical analysis conducted and published by Statistics Canada. Moreover, this thesis focussed on the lack of official discussion regarding a gender divide in Internet access in Canada and presented detailed statistical analysis demonstrating that a gender divide does exist with respect to Internet access in Canada, specifically when considering daily in-home access. The analyses and discussions presented in this thesis provide support for the notion that ambiguous access definitions permit the use of ambiguous statistical measurements, and lead to weak access policies.

One specific area not examined in detail yet is the role media outlets in Canada play in perpetuating the weak definitions of access articulated by Statistics Canada. As

noted earlier, Hacker suggests that journalists and authors take data reports at face value, without considering methodology and reporting methods (Hacker, 2002). At the beginning of Chapter 2 we discussed the article published in the *Globe and Mail* after the release of results from the 2000 General Social Survey. As feared by Hacker, the author (Brethour, 2001) did not question the results of the Statistics Canada report in any manner. The article touted the fact that the gender gap has closed, while there remain significant access disparities for demographic indicators such as age, income, education and geographic location (Ibid). However, there was no actual definition of access included in the article. Thus the reader is left unaware that for the results from this particular study, a regular user is one who accessed the Internet at least once over a 12 month period from any location.

The same pattern can be seen in several other newspaper articles dating as far back as 1994. Comments such as "Statistics Canada suggests that 60 per cent of Canadian households had at least one member who used the Internet regularly in 2001, up from 51 per cent in 2000" (Cole, 2003) and "He recognizes that not everybody is connected at home yet. But according to Statistics Canada, that is rapidly changing: In 1999, the proportion of homes with one regular Internet user grew to 41.8 per cent, up from 35.9 percent in 1998" (Foss, 2000) appear with no accompanying definitions of what constitutes a regular Internet user, nor even which survey the results are drawn from. As discussed earlier, given that Statistics Canada uses various definitions for a regular Internet user, the reader is left to determine for themselves what the data actually mean.

Should future research be undertaken to examine the way Internet use is reported in the media, the analyst would be obliged to seek articles reporting on results from a wide variety of polling sources. Statistics Canada is only one major source for the media.

Private firms such as the Angus-Reid Group, Pollara, Compas Inc., and Ipsos-Reid are regularly cited. In the preliminary research conducted for this thesis, it was challenging to find a comparable number of references to Statistics Canada data. Furthermore, private polling firms can conduct a survey much more quickly, with very specific questions about Internet use. It should be noted that these private surveys can fall into the same ambiguous pattern as Statistics Canada. In 1997, the Financial Post reported the results of a privately commissioned survey conducted by Compas Inc. The results revealed that “almost 30% of Canadians had Internet access at home” (Powell, 1997). However, there was no further indication regarding frequency of use, or who in the household was using the Internet.

In conclusion, this thesis has demonstrated the full cycle of the impact of ambiguous definitions of Internet access. Beginning with the IHAC reports, moving through the Statistics Canada measurements and discussions, and touching briefly on media analysis, it can be suggested that there is a consistently observable tendency to refer to Internet access as a vaguely defined concept. It is rarely stated if by access the authors are referring to in-home vs. work or any location, if they are referring to daily, weekly, monthly, or even annual access, or often, what connection rates the user has. We do see a repeated emphasis on how Internet users are participating in e-commerce activities, be it e-banking or online shopping, but these represent a small fraction of the total amount of time spent on-line.

With respect to producing a more concrete analysis of Internet access, this thesis looked specifically at how the issue of a gender divide is considered in the official body of work on Internet access. It was quickly made clear that gender was not given high priority

in any discussion of digital divides, both in the statistical measurement of digital divides and corresponding official literature. Data analysis performed by this author has clearly demonstrated that gender should be considered as a significant predictor of Internet access, particularly with respect to analyses of frequency of access. It remains true that income, age, and education are all stronger predictors of access, but gender should not, by any means, be considered inconsequential.

Unfortunately, unless the new disaggregated HIUS is deployed in the next year, it is unlikely that we will see any increased discussion of an Internet access gender divide in Canada. Moreover, even if the disaggregated survey is conducted, the stated priority of Statistics Canada is to examine e-commerce in greater detail. Therefore, it is likely that we will continue to see a lack of clear discussion of the gender divide, and other divide sites such as income, age, and education, in favour of increased analysis of how Canadians are spending money on the Internet. On a positive note, if the disaggregated survey is conducted on an annual basis, the disaggregated datasets will be publicly available for analysis from the public interest perspective, permitting scholars and critical analysts to highlight areas of study that are neglected by Statistics Canada and the federal government.

Appendix A

Methodology

A.1 Data Preparation

There were six datasets used in the analyses presented in this thesis. Each required some preparation prior to beginning any analysis. The HIUS datasets required more preparation than the 2000 GSS. Specifically, they required disaggregation, whereas the 2000 GSS was already disaggregated. However some data preparation techniques were applied to all datasets. For all crosstab analyses, the weight variable was enabled. For all logistic regression analyses, the weight variable was removed. Missing values were identified for all variables used in the analyses. For the purposes of logistic regression, the gender variable in all datasets was recoded from 1 = male; 2 = female to 0 = female; 1 = male. This is because of the way logistic regression provides responses. The new recoding permits a comparison of the predicted odds of men as compared to women

having Internet access, as opposed to the predicted odds of women compared to men. It seems like a simple distinction, but it permits a more intuitive way to describe the results. I.e., men are 1.5 times more likely than women to be Internet users, rather than women are 0.5 times less likely than men to be Internet users.

A.2 HIUS datasets

In order to disaggregate the data, a filter was applied to the data. For each dataset, the variable FAMTYPE is coded as follows: 1 = children <18; 2 = children > 18; 3 = one person; 4 = multi-family. To disaggregate the data, only respondents who selected 3 were included in the analyses. Thus, the households measured were single person households, and when the variable indicating the gender of the head of the household was used (HSEX), this measured the gender of the head of the single person household—or in other words, the individual respondent.

In order to measure frequency of access (daily, weekly, monthly or less) individually, it was necessary to recode a variable measuring frequency of access into three new variables.

Table A.1: Frequency of use at home: re-coding structure

1997-1999		2000-2001		New Daily	New Weekly	New monthly or less
Old Values		Old values				
1	min. 7x/wk	1	Daily	1 = yes old val. 1	1= yes old val. 2	1 = yes old val. 3, 4
2	min. 4x/wk	2	Weekly			
3	1-3x/ mth	3	Monthly	0 = no old val. 2, 3, 4	0 = no old val. 1, 3, 4	0 = no old val. 1, 2
4	< 1x/mth	4	Rarely			

The following is the list of demographic variables and their categories used for the 1997-2001 HIUS.

HAGE	HEDUCL	QUART	RECODE GENDER
1 < 35 years	1 < high school	1 < 18,000	0 female
2 35-54 years	2 high school or	2 18,000-29,999	1 male
3 55-64 years	college, no	3 30,000-49,999	
4 > 64 years	university	4 > 49,999	
	3 university		

A.3 2000 GSS

For the 2000 GSS, variables measuring frequency of access from home (h); work (F5), school (F7), and other locations (F9) were recoded in the same manner as presented for the HIUS frequency of use variables. This provided individual variables for daily, weekly, and monthly or less use for each of the four locations.

The demographic variables used from the GSS were as follows.

AGEGR10	EDU5	INCMHSD	RECODEGENDER
1 15-24 years	1 doctorate, masters, or	1 no income	0 female
2 25-34 years	bachelor's degree	2 < 5,000	1 male
3 35-44 years	2 diploma/certificate	3 5,000-9,999	
4 45-54 years	from community coll.	4 10,000-14,999	
5 55-64 years	3 some university/	5 15,000-19,999	
6 65-75 years	community coll.	6 20,000-29,999	
7 > 75 years	4 high school diploma	7 30,000-39,999	
	5 some secondary,	8 40,000-49,999	
	elementary, no school	9 50,000-59,999	
		10 60,000-79,999	
		11 80,000-99,999	
		12 > 99,999	

A.4 Rate Ratio vs. Quartile Ratio

Here, we explain how we calculate the values in the final three columns of Table 3.12. A portion of that table is reproduced below.

Year	Bottom quartile	Rate of increase	Top quartile	Rate of increase	Quartile ratio	Rate ratio
1995	4.80%	—	22.4%	—	—	—
1996	6.10%	+27.1%	29.8%	+33.0%	4.67	0.82

The “rate of increase” columns are calculated by taking the two values in the column immediately to the left. For example, the rate of increase for the bottom quartile from 1995 to 1996 is

$$\left(\frac{6.10}{4.80} - 1\right) \times 100 = 27.1\%, \quad (\text{A.1})$$

and for the top quartile it is

$$\left(\frac{29.8}{22.4} - 1\right) \times 100 = 33.0\%. \quad (\text{A.2})$$

The quartile ratio is calculated by dividing the top quartile value by the bottom quartile value from the previous year. Thus, the quartile ratio for 1996 uses the values from 1995:

$$\frac{22.4}{4.80} = 4.67. \quad (\text{A.3})$$

The rate ratio for a given year is found from dividing the rates of increase for that year. So, in 1996, the rate ratio is found from (A.1) and (A.2) as

$$\frac{27.1}{33.0} = 0.82. \quad (\text{A.4})$$

The justification for using these calculations can be found in Sciadas (2002).

A.5 Converting Std (B) to Exp (B)

Bimber and Reddick use Std (B) to present their results. Silver uses Exp (B). Both provide the same information, just presented in a different manner. I have used Exp (B) throughout my presentation because it permits a discussion of the predicted odds of one group having access as compared to another—a true representation of what logistic regression results mean. Furthermore, Silver is an employee of Statistics Canada, and given that this thesis is, in part, attempting to demonstrate that Statistics Canada has neglected to provide statistically significant information regarding a gender divide and Internet access, I decided to remain consistent with Silver's presentation style.

To calculate Exp (B) from Std (B), the calculation

$$\text{Exp (B)} = e^{\text{Std (B)}} \quad (\text{A.5})$$

is performed. e is the so-called base of the natural logarithms, and its value is about 2.71828. Thus, (A.5) means take e and raise it to the power of Std (B). Conversely,

$$\text{Std (B)} = \ln(\text{Exp (B)}), \quad (\text{A.6})$$

where $\ln$ (pronounced "lawn") is the natural logarithm function.

A.6 Converting crosstab penetration percentages to Exp (B)

Bimber provides penetration percentages from his crosstab analyses of gender and weekly frequency of use. It is possible to convert those percentages into Exp (B) for comparison with the results from the 2000 GSS. The following mathematical process is applied.

Consider the following example:

In 1996, for instance, about 10% of women who had access to the

Internet were frequent users, compared with about 17% of men. In 1999, 25% of women and 38% of men with access were frequent users. (Bimber, 2000, p. 871–872)

Suppose this information were coded using a dichotomous independent variable with 0 being female and 1 being male, and a dichotomous dependent variable with 0 being infrequent Internet use and 1 being frequent Internet use. Then, according to Pedhazur, (1997, p. 723), Exp (B) is precisely the odds ratio. For Bimber's 1996 numbers, the odds of males being frequent users are

$$P_{1996, m} = \frac{17}{100 - 17} = 0.2048 \quad (\text{A.7})$$

and the odds of females being frequent users are

$$P_{1996, f} = \frac{10}{100 - 10} = 0.1111. \quad (\text{A.8})$$

The odds ratio (i.e., Exp (B)) is therefore

$$\text{Exp (B)} \equiv \text{OR} = \frac{P_{1996, m}}{P_{1996, f}} = \frac{0.2048}{0.1111} = 1.8434. \quad (\text{A.9})$$

The same calculations for the 1999 data yield

$$\begin{aligned} P_{1999, m} &= \frac{38}{100 - 38} = 0.6129 \\ P_{1999, f} &= \frac{25}{100 - 25} = 0.3333 \\ \text{Exp (B)} &= \frac{P_{1999, m}}{P_{1999, f}} = \frac{0.6129}{0.3333} = 1.8387 \end{aligned} \quad (\text{A.10})$$

A.7 Deriving the geometric mean of Exp (B)

This is used to derive an average of the Exp (B) for income across several locations for daily use, or to derive an average of the Exp (B) for income across several

years. The following mathematical process is applied: Suppose that there are n different values of Exp (B), called $B_1, B_2, \dots, B_n$. Then the geometric mean of these values is

$$M_g = (B_1 \times B_2 \times \dots \times B_n)^{1/n}. \quad (\text{A.11})$$

As a side note, to apply the same process on n different values of Std (B), $b_1, b_2, \dots, b_n$, one uses the arithmetic mean

$$M_a = \frac{b_1 + b_2 + \dots + b_n}{n}. \quad (\text{A.12})$$

It turns out that M_g and M_a obey the same relationship as Exp (B) and Std (B) from equation (A.5):

$$M_g = e^{M_a} \quad (\text{A.13})$$

A.8 Normalizing the Exp (B)

This process was applied to present the results of logistic regression using variables that have been coded in opposite directions. For instance, the age variable is coded with value 1 as the youngest age group, whereas income is coded with 1 as the lowest income category. Given the tendency of the predicted odds of access to decrease as the respondent gets older and increase as income increases, the normalization process permits the Exp (B) for age to be re-presented as if the variable was originally coded in the same direction as income. The following mathematical process is applied: If the Exp (B) for the original age variable is B_1 , then the Exp (B) for the normalized age variable (with value 1 now being the oldest age group instead of the youngest) is $1/B_1$.

Appendix B

Gender and Income

B.1 Statistical examination of the relationship between gender and income.

Using *Canadian Women in 2000: a statistical report* (2000) several points can be presented to demonstrate the link between gender and income.

- Annual Salaries—in constant dollars (p. 135)
Women (1993): \$17,398 Men (1993): \$30, 169
Women (1999): \$19,847 Men (1999): \$32, 104
- lone parent families headed by women have the lowest incomes of all family types (p.137)
- 1997: 19% of total female population in low income situation
- 1997: 16% of total male population in low income situation (p. 137)
- Among single members of the population in 1997 aged 18-64 (p. 138):
Women: 40.9% live in low income situation
Men: 35.1% live in low income situation

- Among seniors, 49.1% of women and 33.3% of men live in low income situations (p.138)
- In 1997, the average earnings of employed women were still substantially lower than those of men. Employed women had average earnings of just over \$21,000, representing 64% of what men made. This includes all jobs, including seasonal employment. (p. 141).
- With respect to full-time, full-year employment, women averaged \$31,000, representing 73% of what men made (p. 141).
- The gap is closing over the years, but there is still disparity between men and women with respect to income.

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