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Diffusion of the Internet and its Effect on Gender Attitudes: A Cross-National Approach

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DIFFUSION OF THE INTERNET AND ITS EFFECT ON GENDER ATTITUDES:
A CROSS-NATIONAL APPROACH

by

Robert Roznowski

A thesis submitted to the Graduate College
in partial fulfillment of the requirements
for the degree of Master of Arts
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Thesis Committee:

Paul Ciccantell, Ph.D., Chair
Ann Miles, Ph.D.
Whitney DeCamp, Ph.D.

DIFFUSION OF THE INTERNET AND ITS EFFECT ON GENDER ATTITUDES:
A CROSS-NATIONAL APPROACH

Robert Roznowski, M.A.

Western Michigan University, 2014

The rapid diffusion of the Internet worldwide generates discussion about the social implications of the Internet. To explore the effect of Internet diffusion worldwide, this study examines changes in reported gender attitudes since the introduction of the Internet. I propose that the diffusion of the Internet fosters egalitarian changes in gender attitudes. Using cross-national data from forty countries over a time span of nearly twenty years, I successfully implement an alternative analysis technique, the slope-slope model, to examine the relationship between rates of Internet diffusion and changes in gender attitudes in the economic, political, and education domains. Internet diffusion affects gender attitudes in the economic domain, but not the political or education domains. As the rate of Internet diffusion increases, fewer people agree that men are more entitled to work than women. The results suggest mixed implications of Internet diffusion worldwide in relation to gender attitudes.

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Robert Roznowski

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INTRODUCTION

The number of Internet users worldwide averages to one out of every three people (World Bank 2013a). The World Wide Web connects Internet users to a network of media distribution, information exchange, and communication facilitation. Although one third of the global population participates in using this modern technology, there is a substantial geographic variation in Internet users. In developing countries, for example, the proportion of households with Internet access is about 28% compared to about 78% of households in developed countries (International Telecommunication Union 2013). The unequal worldwide diffusion of the Internet is representative of broader global inequalities beyond economic development alone. Explanations of the global divide in Internet users situate around the social, political, and economic context that contributes to a country's adoption and use of the Internet. The unequal diffusion of the Internet contributes to a larger pattern of digital and technological inequality labeled the digital divide and represents our changing world in the era of globalization.

There are many social and cultural implications of the Internet acknowledged by sociologists (DiMaggio et al. 2001). Several country-level predictors of Internet diffusion have already been established, ranging from urbanization and fertility to democratic governance and political stability (Robison and Crenshaw 2010). The diffusion of the Internet affects societies as well, for instance, by facilitating democracy and democratic growth in the political domain (Groshek 2009). In recent years, researchers have observed changes in reported gender attitudes on a global scale. The majority of people worldwide report attitudes that support gender equality rather than attitudes that support forms of gender inequality (World Bank 2011). Recent evidence also provides support for increasingly egalitarian gender attitudes in many low income and non-Western nations (Dorius and Alwin

2010). In developed countries, cohort studies on gender attitudes confirm shifts toward egalitarian gender attitudes over the last few decades, that is, since the early 1990s (Dorius and Alwin 2010). In the United States, period effects and cohort effects are strongly related to shifts in gender attitudes, although the impetus for change is still unclear (Davis and Greenstein 2009:91-92). In other words, reported gender attitudes vary over time as the population shifts, although this clearly does not explain why reported gender attitudes change. Dorius and Alwin (2010) confirmed the trend of increasingly egalitarian attitudes toward gender equality and further predict the global converging trend in the structure of gender belief systems (19). Beliefs about gender equality across economic, political, and social domains are becoming strongly correlated with each other, regardless of traditional or egalitarian beliefs about gender. For example, reported attitudes that women should have equal right to a job tend to correlate with reported attitudes that women should have equal right to a university education. Respondents from a country who report that women should have equal rights in one domain tend to report similar attitudes in other domains. Likewise, respondents from a country who report that men should have more rights in one domain tend to report similar attitudes in other domains. A set of interrelated beliefs about gender that can be used to predict other beliefs about gender is referred to as a “gender ideology” (Dorius and Alwin 2010:6-7). The way these beliefs are organized around each other constitute a structure, and the global agreement in the structure of gender belief systems (i.e. interrelated beliefs about gender) may, overall, facilitate efforts to promote gender equality (Dorius and Alwin 2010:17).

Other cross-national research studies on gender ideologies, gender attitudes, and gender belief systems explain why reported attitudes toward gender equality vary across countries. Bergh (2006) outlined two competing explanations of why reported gender

attitudes vary across countries and individuals. One theory emphasizes that a country's level of development affects gender attitudes, measured by individual-level structural factors such as socioeconomic status. In this perspective, higher levels of development relate to reported gender attitudes that are more egalitarian. A second theory emphasizes that individual values affect gender attitudes. In this perspective, more egalitarian values in general relate to more egalitarian gender attitudes. The analysis of survey data for industrial societies indicated that structural factors *and* values affect gender attitudes. The stronger overall effect, however, is attributed to structural factors such as a country's level of economic development (Bergh 2006:17). The World Bank Development Report on Gender and Equality indicated that gender norms may be influenced by increased exposure to new knowledge made possible by the expansion of new information and communication technologies (World Bank 2011:175).

The Internet, one of the latest global information and communication technologies, may play a role in shifting gender attitudes. Furthermore, the unequal diffusion of the Internet may produce surprising social changes. Steady Internet user growth rates in developed countries combined with the disparities in Internet diffusion across countries prompts attention to the Internet. The Internet is of particular importance to sociologists because of its rapid expansion as a new medium, which creates a measurable process of diffusion and an ideal research environment for testing theories related to technological diffusion and the media (DiMaggio et al. 2001:308). The Internet increases exposure to new information that may conflict with or reinforce gender attitudes. Social media networks on the Internet such as Facebook or Twitter broaden communication. At the same time, search engines such as Google or Yahoo provide access to a virtually unlimited amount of information. These new sources of information and communication are embedded with values, beliefs, and ideologies that may be more or less supportive of gender equality.

Some aspects of the Internet may reify gender power structures. Through textual analysis of Internet pornography websites, Heider and Harp (2002) argue that “the Internet may just be a newer way of delivering older and more familiar messages, ultimately reinforcing old and all too familiar power structures” (286). Their findings indicate that Internet continues to marginalize groups and reinforce race and gender power structures. On the other hand, the Internet may break down power structures by changing the way meaning is established. Digital media requires new ways of thinking, not only because of the multimodality of textual, visual, and audio representation, but also because of the way knowledge is manufactured, reproduced, and distributed globally. Cope and Kalantzis (2010) argue that changes in the representation of knowledge potentially influence the way knowledge and meaning are produced. The digital era, which includes the Internet and Internet-mediated social media, may affect our means of knowledge production and, ultimately, our feelings, thoughts, and actions (Cope and Kalantzis 2010:38). Information and knowledge distribution in this context may retain a level of arbitrariness as knowledge is often co-produced and *less* mediated than traditional forms of distribution.

The central problem is whether the diffusion of the Internet is supportive of gender equality, and, if so, under what circumstances. Whether the diffusion of the Internet is supportive of gender equality can be distinguished by changes in cross-national gender attitudes as the Internet spreads globally. This may provide insight as to whether Internet diffusion plays a role in attitudes about gender. Therefore, the topic of this study is to examine the effect of Internet diffusion on gender attitudes on a cross-national level. The objectives of this research are:

- (1) to examine changes in cross-national gender attitudes since the introduction of the Internet,

- (2) to examine the rate of cross-national Internet diffusion since the introduction of the Internet,
- (3) to compare the rate of cross-national Internet diffusion with changes in cross-national gender attitudes,
- (4) to establish the significance and importance of the relationship between Internet diffusion and gender attitudes, and
- (5) to examine whether the structural factors of human development, democracy, and gender inequality affect the relationship between Internet diffusion and gender attitudes, if one exists.

Research Questions and Hypotheses

‘Does the Internet influence gender attitudes?’ is the primary research question that guides this study. ‘How does the unequal diffusion of the Internet influence attitudes about gender?’ is a secondary research question. This study seeks to discover whether the Internet supports more egalitarian changes in gender attitudes or more patriarchal changes in gender attitudes, or whether gender attitudes are not influenced by the Internet. Furthermore, this study seeks to explain the circumstances in which gender attitudes are the most heavily influenced. The main argument I present is that the diffusion of the Internet affects attitudes toward gender equality and fosters more egalitarian attitudes. The research hypotheses examined in this study are:

H0: There is no significant relationship between rates of Internet diffusion and changes in gender attitudes,

H1: There is a significant relationship between rates of Internet diffusion and changes in gender attitudes,

H2a: Citizens of countries with higher rates of Internet diffusion display more egalitarian or less patriarchal changes in gender attitudes,

H2b: Citizens of countries with lower rates of Internet diffusion display less egalitarian or more patriarchal changes in gender attitudes.

Conceptual Definitions

The Internet is a network of information and communication exchange. It is also a distributor of media and entertainment. A distinction is often made between the World Wide Web and the Internet, but for the purpose of this research study, the Internet refers to internetwork technology since the debut of the World Wide Web in the early 1990s. Thus, the diffusion of the Internet, or Internet diffusion, refers to the rate of increase in the number of Internet users since the creation of the World Wide Web. Internet users are defined in World Development Indicators 2013 (World Bank 2013b) as: “the percentage of individuals who have used the Internet (from any location) in the last 12 months...via a computer, mobile phone, personal digital assistant, games machine, digital television, or similar device” (89).

Gender attitudes are assessed by citizens’ responses in a survey about gender equality and reflect beliefs about gender in politics, education, and economy in the public domain (Dorius and Alwin 2010:11). Patriarchal attitudes represent one side of the gender attitudes scale employed by Dorius and Alwin (2010), and are defined as citizens’ responses toward gender equality that reflect beliefs supporting male power, privilege, and dominance in politics, education, and economy. Egalitarian attitudes represent the other side of the gender attitudes scale and, conversely, are defined as citizens’ responses toward gender equality that reflect beliefs supporting equality and opportunity in politics, education, and economy.

Assumptions

This study does not contribute to media effects studies nor does it follow problematic media effects models outlined by Gauntlett (2002). Accordingly, the influence of the Internet on gender attitudes is understood in a very general sense; whatever effects that the Internet may have on behavior, or in this case attitudes, cannot be linked to any specific Internet content (Gauntlett 2002:29). Rather, this study focuses on the diffusion of the Internet itself and the empirical relationship between Internet diffusion and gender attitudes. Furthermore, the Internet *sui generis* is understood as a technological medium dependent upon other social structures, norms, and institutions rather than an independent entity. Davis and Greenstein (2009) argue that research should consider the influence of gender ideology as “one of the potentially explanatory mechanisms for gendered behaviors” (100). Although I do not examine whether changes in gender attitudes affect actual gender roles in the political, educational, and economic domains, evidence supports the link between gender attitudes and gender equality (Inglehart and Norris 2005; Gray, Kittilson, and Sandholtz 2006; Davis and Greenstein 2009). Therefore, the factors that affect gender attitudes are rigorously investigated in an effort to provide a clear and comprehensive understanding of the conceptual or theoretical processes revolving around gender (Davis and Greenstein 2009:99-100).

In the next section, relevant literature is reviewed and theoretical notions of Internet diffusion and gender attitudes are considered. The methodology section outlines the research design, description of data, and procedures. The results section provides description, interpretation, and summary of the findings. The theoretical implications, limitations, and suggestions for future research pertaining to the findings and research hypotheses are considered in the final section.

LITERATURE REVIEW

The developments that led up to the Internet and the World Wide Web were guided by actors with opposing interests. The concept of an internetwork was initially funded by the United States government in the late 1960s to strengthen military research resources and technology, but it was never regulated by the state since the majority of users were trusted professionals and academics (Castells 2001:10; Briggs and Burke 2010:264; Townes 2012:47). The initial design of the Internet was rejected by the U.S. government, although the proposed military strategies of flexibility, decentralization, and autonomy influenced the operating principles of the Internet today (Castells 2001:17). Townes (2012) noted that “the US government put a tremendous stock in technological knowledge, and gave the producers of that knowledge - academics - relative freedom to pursue it. The result was a network technology with those freedoms embedded” (45).

The academic and professional command over the Internet remained intact up to the development of the World Wide Web in the 1990s. By this point, commercial actors emerged and altered the landscape of the Internet by focusing on the user rather than the design of the Internet. The embedded freedom of the Internet remained permanent. Large corporations such as Yahoo and Google formed with the World Wide Web and others such as Microsoft and Apple grew in size and scope. Corporate profit motives conflicted with the software provider ideas of liberation and empowerment of the Internet user, creating uncertainty about the future of the Internet (Briggs and Burke 2010:265-266). The rise of user generated content, or Web 2.0, blurred ownership and control as users themselves began to create and distribute information. The literature review examines the causes and effects of Internet diffusion followed by the role of the Internet in relation to gender and gender equality.

The Causes of Internet Diffusion

The Internet is part of a larger system of information communication, education, and entertainment, hereafter referred to as the media. The media is described by Briggs and Burke (2010) as, “a system in perpetual change, including technological change, in which different elements play greater or smaller roles” (5). Media in the context of globalization, or global media, allow access to previously restricted information or information with limited access and make it widely available. Print media was one of the first global mediums. Prior to print media, literacy and knowledge were restricted to the elite. Print media was problematic for religious elites, government authorities, and those in power, because it allowed readers with lower social status and less power to obtain new perspectives and worldviews (Briggs and Burke 2010:15).

One reason the Internet has been so successful is its institutional context and versatility, driven by commercial and educational enterprises with a wide variety of purposes (DiMaggio and Cohen 2004). These characteristics, among others, have allowed indirect competition with other forms of media without complete domination or replacement of other forms of media (DiMaggio and Cohen 2004). Manuel Castells (2001) argues that the technology of the Internet allowed for the formation of the network society. The network society is without boundaries, a social structure built on stable power relations and characterized by “specific configurations of global, national, and local networks in a multidimensional space of social interaction” (Castells 2009:18-19). The idea of a network society developed further as the Internet became more integrated into society. Rainie and Wellman (2012) argue that we live in a world of networked individualism and describe how certain technologies, including the Internet, connect and network people as individuals rather than as members of a particular group. They elaborate: “In the world of networked

individuals, it is the person who is the focus: not the family, not the work unit, not the neighborhood, and not the social group” (Rainie and Wellman 2012:6).

Predictions and analyses of the process of Internet diffusion across countries have been provided since the early years of the Internet (for example, Goodman et al. 1994; Press 1997; Rai, Ravichandran, and Samaddar 1998; and Petrazzini and Kibati 1999). As data became increasingly available, so did the number of scholarly contributions. Recent findings suggest that there is still a wide range of barriers preventing the equal diffusion of the Internet and that the digital divide is expanding (Robison and Crenshaw 2010).

Generally, higher levels of economic development across countries predict higher Internet diffusion rates, although political and social factors are often associated with Internet diffusion. A recent analysis of the determinants of cross-national Internet diffusion rates by Wunnava and Leiter (2009) narrowed down the predictors of Internet diffusion. In support of previous research on Internet diffusion, a country’s economic strength, telecommunications and technology infrastructure, English proficiency, and political and economic openness all influence Internet usage. Education and income equality are important factors as well (Wunnava and Leiter 2009). This set of variables demonstrates the diverse factors associated with Internet diffusion and the digital divide. Other studies mentioned the role of demographics, such as fertility rates and urbanization, but still acknowledged national level factors, such as globalization and political stability (Robison and Crenshaw 2010). More often than not, the majority of these studies identified the factors involved in Internet diffusion. Almost all findings suggested that the digital divide is not solely explained by levels of economic development, but that political and other social factors play important roles as well (Beilock and Dimitrova 2003; Guillen and Suarez 2005;

Milner 2006; Vicente and Lopez 2008; Robison and Crenshaw 2010; Kim 2011; and Gulati and Yates 2012).

The political domain plays an important role in the diffusion of the Internet. Not all countries (i.e. governments) grant the freedom of the Internet. Democracies, for example, are more likely to adopt the Internet than autocracies (Milner 2006:180). These authoritarian states may fear the potential of the Internet to invoke political change (Freedom House 2012). A report published by the Freedom House Organization, “Freedom on the Net 2012,” showed that restrictions on Internet freedom are now implemented using less overt and more insidious methods than in the past (Freedom House 2012). Milner (2006) concluded that these actions may lessen integration into the world economy, slow down development, and deepen the digital divide (196).

The Effects of Internet Diffusion

As the Internet developed into a powerful information and communication technology and medium, its effects on societies conspicuously emerged. In comparison to other information and communication technologies and mediums, such as television, the Internet is only in the early years of existence, yet debates on the effect of the Internet in a globalized world are fruitful. Noh and Yoo (2008), for example, found a complex relationship between Internet diffusion, economic growth, and income inequality in which Internet diffusion positively affects economic growth in countries with less income inequality. The diffusion of the Internet also *produces* social and political effects. The democratizing effects of the Internet are frequently noted in current research. Using a data set that spans from 1994 through 2003, Groshek (2009) tested the effect of Internet diffusion on democratic growth and found that the Internet serves as an agent of democratization in countries undergoing democratic processes (131). One explanation for

the democratic effects of the Internet is that the Internet fulfills information functions and changes the media dynamics involved in democracy (Groshek 2009:118). Consistent with earlier studies, there were indications that the Internet has the potential to serve as an agent of democratization in developing and non-democratic countries as well (Groshek 2009:132).

Nisbet, Stoycheff, and Pearce (2012) found that Internet use increases citizen demand for democracy (261). They argue that “Internet use may play a more meaningful role in strengthening and enhancing young democracies through impacting citizen attitudes rather than promoting outright democratic transitions among autocratic regimes” (Nisbet et al. 2012:261). In regards to the role of the Internet in political transitions, unsubstantiated claims have been made that the Internet, through social media, spurred the Egyptian revolt in 2011, among other claims of the role of the Internet and social media in the ‘Arab Spring’ (Groshek 2012). According to Groshek (2012), this argument “misinterprets the evolution of political and technological changes that preceded the Egyptian revolt” (764). In other words, the Egyptian revolt occurred in a distinctive sociopolitical and historical context, although Groshek (2012) noted that there is no reason to diminish the role of the Internet in the revolt (766).

Thus, when analyzing the effects of Internet diffusion on gender attitudes, it is important to consider the social and historical context of the effects. A common criticism of cross-national research, according to Livingstone (2003), is that “it produces ‘measurement out of context’ [because] it asserts methodological and/or theoretical universalism at the cost of recognizing cultural specificity” (482). In this study, I attempt to achieve a well-rounded understanding of the relationship between Internet diffusion and gender attitudes. Based on the literature review, three measures were used to control for the economic, political, and

social contexts that may confound the relationship between Internet diffusion and gender attitudes: level of human development, level of democracy, and level of gender inequality.

In addition to determining which variables to include that properly contextualize a relationship, the operationalization of many concepts is difficult. National income presents one of the more problematic variables to measure because there are so many different possibilities of detailed data (Babones 2013). However, Babones (2013) noted that the use of national income itself is contested because it is often used in place of concepts that are not entirely economically-based (59). For this reason, I decided not to use national income as a single measure of the economic domain, but rather applied the United Nations Development Program's (UNDP) Human Development Index. Furthermore, I implemented a measure of democracy published by Freedom House to capture the political domain. Although the measure has its downfalls, other measures of democracy are not necessarily viewed with greater optimism (Babones 2013:73). Level of gender inequality, represented by the UNDP's Gender Inequality Index (GII), captured the social domain in terms of the division of gender in society. The GII (formerly the Gender Empowerment Measure) was implemented in World Values Research by Alexander and Welzel (2011) to measure females' exclusion from power and was used similarly in this study. Other procedures and methodological issues are discussed in the methodology section.

The Internet and Gender Equality

The Internet may play an important role in the trend toward global gender equality. Information and communication technologies (ICTs), such as the Internet, have generally allowed for an increase in economic opportunities for women all over the world (World Bank 2011; Gray, Kittilson, and Sandholtz 2006). The influence of the Internet on gender exists outside of the economic domain as well:

Beyond the economic sphere, increased access to information, primarily through higher exposure to television and the Internet, has also exposed many in developing countries to the roles women play in other parts of the world, which may affect gender roles and outcomes (World Bank 2011:268).

There are implications for gender equality resulting from the diffusion of media and expansion of information and communication networks such as the Internet: “By broadening women’s sources of information beyond their immediate family and peers, these networks expand the range of known alternatives and options” (World Bank 2011:175). Hilbert (2011) suggested that ICTs represent an opportunity for women to overcome traditional inequalities in developing nations (487). Gray et al. (2006) found that the spread of global norms may improve the quality of life for women in the economic, political, and social domains, and that “changes in attitudes and values are key to women achieving greater equality” (327). However, a digital gender gap was reported in most studies on Internet use by gender across countries (Moghaddam 2009; World Bank 2011). For some developed and developing countries, differences in Internet access for men and women exceed 10 percent and do not necessarily correlate with a country’s overall level of Internet access (World Bank 2011:262). The digital gender gaps among different countries are justified for different reasons and may be attributed to gender differences dependent upon socially and culturally constructed gender roles and norms (Moghaddam 2009:731).

Cyberfeminism and cyberfeminist discourses consider the Internet and digital technologies’ relationships to gender and gender equality. Cyberfeminist practices range from participating in online discussion forums and blogs to organizing social gatherings and political demonstrations. Everett (2004) summarized the influence of the Internet and digital technologies on feminism and feminist practices and suggested that the Internet is beneficial

because it joins feminists. However, Daniels (2009) reviewed literature on cyberfeminism and cyberfeminist practices and notes the mixed implications of the Internet:

For some, the Internet economy reproduces oppressive workplace hierarchies that are rooted in a global political economy. For others, the Internet represents a “tool” for global feminist organizing and an opportunity to be protagonists in their own revolution. For still others, the Internet offers a “safe space” and a way to not just survive, but also resist, repressive sex/gender regimes (Daniels 2009:118).

Certain ideologies are embedded in the Internet, for example, the aforementioned notion of freedom buried in the design of the Internet. Other ideologies shape the Internet, however, and may not be as liberating. Castells (2001) affirmed: “the fact that the rise of the Internet took place in conditions of social inequality of access everywhere may have lasting consequences on the structure and content of the medium” (255). Some aspects of the Internet reflect the societies where Internet use is most prevalent. Heider and Harp (2002) analyzed the prevailing ideologies of Western culture in the arena of Internet pornography and described that upon arrival into the world of Internet porn, “the Web stops being a user-operated medium and pornography seemingly takes over the screen, temporarily wresting control away from the computer user” (292). One can imagine the parallels between profit-motivated web advertisements flooding the screen promoting the system of capitalism in the same way that Internet pornography promotes the system of patriarchy. The public is witnessing what could be described as the commodification of communication, where privatization and monopolization of the Internet are shaping the future of the Internet and the ideologies that rule its landscape (Foster and McChesney 2011:27-28). The most important consideration, I argue, is what the Internet promotes overall, and if and how it changes our worldviews.

According to the World Bank World Development Report on Gender and Equality (2011), globalization has the potential to foster more egalitarian views by influencing existing

gender roles (267). Indeed, Anthony Giddens (2000) associated the breakdown of tradition with globalization and noted that, “the emergence of a global information society is a powerful democratizing force” (96). Explanations are attributed to processes of modernization, which suggest that changes brought about by industrialization lead to similar societal changes, and eventually to more democratic political participation (Inglehart and Norris 2005:11). Dorius and Alwin (2010) argue that gender belief systems are trending toward a twentieth-century Western gender ideology of egalitarian beliefs, providing “clear support for significant vertical diffusion of a gender egalitarian belief system” (17). Furthermore, they suggested that the cause of this trend is beyond national-level factors, such as the expansion of a world political system and the growth of international organizations that spread twentieth-century Western ideologies (Dorius and Alwin 2010:17).

The Internet is one global development that affects all countries, but to suggest that the Internet changes culture is a bold argument dependent upon the interpretation of culture. Based on changes in reported attitudes from the World Values Survey, Inglehart and Norris (2005) claim that the path toward gender equality is part of a broader process of culture change (154). In their view, culture change refers to changes in reported attitudes. The underlying assumption, however, is that reported attitudes reflect culture. But do reported attitudes genuinely account for culture? World Values Survey researchers tend to assume this is the case. Inglehart and Norris (2005), for example, argue that the perceptions of the roles of females and males are “shaped by the predominant culture - the social norms, beliefs, and values existing in any society” (8). In this perspective, investigating citizens’ perceptions of the roles of females and males is the same as investigating culture. While they contend that changes in attitudes are synonymous with culture change, I do not. Reported attitudes about gender are not about culture per se. Rather, reported attitudes about gender

are about the answers to the questions asked in the survey. The questions asked in the survey addressed the roles of females and males in the economy, politics, and education. Responses, then, reflect conceptions of the roles of females and males in the public sphere.

The complications of culture may arise from the conceptualization of culture itself. How does one define culture as a concept, let alone establish measures of culture and culture change? Conceptualizations of culture differ across the social sciences. Ly (2006) reviewed the complex history of the concept of culture and the theoretical context in which debates about culture occur, highlighting perspectives of evolutionism, historical particularism, semiotic theories, the role of power and stratification, and postmodernism. Indeed, the concept of culture may be viewed as a product of modernity itself, caught between modernism and postmodernism (Pasquinelli 1996:56). This notion contributes to the postmodern view of culture that argues for the elimination of the culture concept itself, although critics point out that this perspective treats culture as a uniform concept (Ly 2006:203).

One perspective emphasizes culture as ideational, that is, as a system of ideas (Keesing 1974). Geertz (1973), for example, argues for a semiotic concept of culture, “[b]elieving, with Max Weber, that man is an animal suspended in webs of significance he himself has spun, I take culture to be those webs, and the analysis of it to be therefore not an experimental science in search of law but an interpretive one in search of meaning” (5). For Geertz (1973), culture is publicly rather than psychologically experienced because meaning is established outside of the individual (10). Culture, then, is a context in which systems of symbols can be described (Geertz 1973:14). Relating the concept of culture, however, to the relationship between Internet diffusion and gender attitudes is difficult. Responses toward gender equality may be viewed as a system of interrelated beliefs about

gender in the economy, politics, and education in the public sphere, but this does not adequately reflect a meaningful concept of culture.

Based on the complexity of culture as a concept, my analysis is limited to the empirical relationship between Internet diffusion and gender attitudes, perhaps for no reason other than my inability to account for culture in research of this kind; culture is not a uniform or measurable concept. To simply view culture as a categorization device (as the World Values Survey researchers do) is a severely limiting approach. For one, researchers and respondents do not necessarily maintain a mutual understanding of the content that is addressed. A better approach is to view culture similar to Geertz (1973), as a theory that considers systemic relationships rather than an approach that focuses on attributes such as racial, gender, or class “identities” (Boggs 2004:189). Therefore, I do not argue that the diffusion of the Internet influences culture, nor do I address that changes in reported attitudes reflect changes in culture. Reported attitudes about gender equality may have some connection to culture, but that connection remains unknowable. A survey about the roles of females and males is just that and does not constitute a survey about culture. Reported attitudes about gender are, more precisely, about conceptions of the roles of females and males in the economy, politics, and education. The relationship between Internet diffusion and reported attitudes about gender, if anything, is about the effect of Internet diffusion on conceptions of social roles of females and males.

Our world has changed and is still changing because of the Internet. Initial accounts of the future of the Internet were optimistic, signifying the end of restricted or censored information so that “all institutions were going to be changed for the better” (Foster and McChesney 2011:2). Indeed, the Internet is potentially a liberating technology. Many view the future of the Internet with a utopian outlook, frequently cited as cyber optimists (Wyatt

2008). For followers of this perspective, the Internet is a means of empowerment, freedom, and equality. It is an empowering medium and technology that expands the public sphere (Dahlberg 2005). These “enthusiasts” argue that the Internet will reduce inequality and improve one’s life chances (DiMaggio et al. 2001:310).

At the same time, the Internet is potentially an oppressive technology. Challenging the utopian view are those who recognize the Internet as a means of power, oppression, and imperialism. With a dystopian outlook on the future of the Internet, their perspective is frequently labeled cyber pessimism or “cyber-skeptics” (DiMaggio et al. 2001:310). From this perspective, the Internet serves as an imperialistic medium and technology that contributes to the corporate controlled culture industry (Dahlberg 2005). For some, the Internet is gradually succumbing to capitalist control of information as information is increasingly framed as a public good (Foster and McChesney 2011). A large number of commentators offered insight on the debate (for example, Hedley 1998; Main 2001; Heider and Harp 2002; Amichai-Hamburger, McKenna, and Tal 2008; Wyatt 2008; Morozov 2010; Foster and McChesney 2011). Since the advent of the World Wide Web, the future of the Internet has become a subject of debate. As with the telegraph, radio, and television, the Internet may be another victim of technological determinism, the notion that technology innately drives social change. The dualistic labeling of the Internet, either as an oppressive medium and technology or as an empowering medium and technology, is not a universally accepted discourse. Groshek (2009) acknowledged that proponents of the debate are from different backgrounds and vary widely in their utopian or dystopian perspectives (116). However, Green and Singleton (2013) noted, “feminist theorists, including sociologists, have moved beyond simplistic binary conceptualizations of technology as oppressive or liberating for women, towards a recognition of digital technology as a mixed blessing” (47).

Indeed, there are opposing interests that seek to harness the technology of the Internet. Political activist groups and national governments hold a particular interest in the Internet as a tool to further political goals. Digital and networked technologies and “mundane Internet tools,” such as social media networking, email, and video sharing, are standard in large-scale social and political movements (Nielsen 2013:175). Activist hacking groups tend to use disruptive tactics and launch distributed-denial-of-service (DDOS) attacks that usually leave a website unusable (Sauter 2013:985). Several national governments employ methods of censorship and information control. Many countries, for example China, create internal systems of censorship and may sponsor network intrusions, DDOS attacks, or break-ins of government centers (Gutmann 2010). As a result of opposing interests, the Internet is not necessarily universal in content or access across countries.

Regardless, the Internet is *doing something*. The diffusion of knowledge and culture are probable with the diffusion of the Internet. However, the attempt to account for knowledge and culture diffusion is a complex task. Certainly the Internet gives access to an infinite amount of new information that would have been impossible to obtain just decades ago. It also allows us to communicate with one another worldwide across nations, cultures, and peoples. Does the global networking of information and communication fostered by the Internet change our conceptions of the roles of females and males and ultimately affect our attitudes toward gender and gender equality? What are the roles of the economic, political, and social domains in the relationship between Internet diffusion and gender attitudes, if one exists? The next section describes the methods employed that aid in answering these questions.

METHODOLOGY

Research Design and Instrumentation

The primary objective of this research is to examine the relationship between changes in cross-national gender attitudes and diffusion of the Internet. This study also aims to implement an alternative quantitative macro-comparative research design. Using repeated measures data to relate Internet diffusion to gender attitudes, I employed a cross-sectional regression model developed by Salvatore Babones (2013) in his book *Methods for Quantitative Macro-Comparative Research*. Repeated measures designs use multiple data points from the same countries to examine variable change over time (Babones 2013:161). Babones highlighted the strengths and weaknesses to common repeated measures designs, time series cross-sectional designs, and multilevel modeling designs, warning that “the fundamental challenge of working with repeated measures data, however, arises from their very nature as multiple observations of the same units” (164). This may result in the *reductio ad absurdum* by repeatedly slicing time into thinner units and creating an infinite number of units (161). The role of error and time are especially problematic for many repeated measures designs. A better quantitative macro-comparative approach calls for simplicity, since the complex tweaking of designs with highly structured data leaves plenty of room for making errors (Babones 2009).

To avoid some of the problems that arise with repeated measure designs, Babones (2013) proposed the slope-slope model, which “relate[s] the slope of the dependent variable over time to the slopes of the independent variables” (185). In this model, the slopes of the variables are used to estimate the effect of the independent variables on the dependent variable while accounting for changes over time. One strength of this model is that it accounts for changes over time and uses of all the available data to relate changes in the

independent and dependent variables. Rather than focus solely on specific time points, a time-trend is established within countries that includes all time points with available data. This crucial step helps to eliminate measurement problems of time points and also resolves the *reductio ad absurdum* of creating infinite cases (185). The slope-slope model is an attempt to overcome the challenges of repeated measures data while remaining concise and statistically powerful. It is perhaps a more appropriate model than other repeated measures designs, although Babones (2013) admitted it does not resolve all of the questions presented by quantitative macro-comparative research, but that it “may point the way forward” (186).

Data Measurement and Collection

Internet diffusion, the independent variable, was operationalized as Internet users per 100 people. Gender attitudes, the dependent variable, were operationalized by combining three survey questions that measure economic, political, and educational values about men and women in the public sphere. Level of agreement or disagreement toward a statement reflecting each value were given: (1) “When jobs are scarce, men should have more right to a job than women,” which measured attitudes toward gender equality in the economic domain, (2) “On the whole, men make better political leaders than women do,” which measured attitudes toward gender equality in the political domain, and (3) “A university education is more important for a boy than for a girl,” which measured attitudes toward gender equality in the education domain. Responses ranged from 1.0 to 3.0 as Agree (1.0), Neither (2.0), and Disagree (3.0) for the economic domain and from 1.0 to 4.0 for the political and education domain as Agree strongly (1.0), Agree (2.0), Disagree (3.0), and Strongly disagree (4.0). Similar to Alexander and Welzel’s (2011) coding of the GII, 1.0 represented the least patriarchal or most egalitarian attitudes and 4.0 (3.0 for the economic domain) represents the most patriarchal or least egalitarian attitudes. The three domains

when combined were an adequate measure of gender attitudes toward gender equality in the public sphere (Alexander and Welzel 2011:46). A factor analysis of the economic, political, and education measures of gender attitudes was conducted to verify that the three domains were sufficient as a coherent measurement of gender attitudes as a whole. The three measures were standardized to allow for a uniform interpretation of regression coefficients (Alexander and Welzel 2011:69). Together, the three domains are a consistent measure of gender attitudes in the public sphere.

In accordance with previous cross-national studies on Internet diffusion and cross-national attitudes (Noh and Yoo 2008; Nisbet et al. 2012; Alexander and Welzel 2011), level of human development, level of democracy, and level of gender inequality were used as controls for estimating the effect of Internet diffusion on gender attitudes. Level of human development was measured by the Human Development Index (HDI), “a composite index measuring average achievement in three basic dimensions of human development - a long and healthy life, knowledge and a decent standard of living” (UNDP 2013:147). Ranging between 0 and 1, the HDI is the mean of three indices: life expectancy, years of schooling and expected years of schooling, and per capita gross national income, where 1 indicates that achievements across all dimensions are high and 0 indicates that achievements across all dimensions are low. Although there may be shortcomings to the HDI, it is a substitute to using national income alone to measure level of development. Level of democracy was measured by the Freedom House Freedom Rating, an annual survey that averages points scored on a series of questions related to the political rights and civil liberties of a country (Freedom House 2014). Ratings are given for political rights and civil liberties and the average determines the status of freedom into three categories: free, partly free, and not free. For this study, countries were coded numerically as Free (1.00), Partly Free (2.00), and Not

Free (3.00) and the mean rating was calculated from 1990 through 2012 rather than the coefficient due to relative stability in the freedom rating for the majority of countries, thereby making level of democracy time-invariant.

Alexander and Welzel (2011) found that a group's patriarchal values are relative to the patriarchal values and patriarchal power structure of the society. The Gender Inequality Index (GII) was implemented in this study to control for possible spurious effects of a country's level of gender inequality on gender attitudes. The GII measures inequality in achievements between women and men in reproductive health, empowerment, and the labor market (UNDP 2013). Ranging from 0 to 1, the GII shows the decrease of human development as a result of inequality between women and men, where 0 indicates that women and men are equal in their endeavors across all dimensions and 1 indicates that equality between women and men is consistently limited. The final model estimated the effect of Internet diffusion on gender attitudes while controlling for changes in level of human development, level of democracy, and level of gender inequality.

The target population was the worldwide population and the unit of analysis was the country. The population sample of 40 countries was selected based on the available survey data on gender attitudes and development data on Internet diffusion. The combined sample of countries represented about 76% of the global population. The countries included in the analysis represent different geographic localities and vary in level of human development, gender inequality, and democracy (see Appendix A). However, many other countries were still missing from the final analysis and this may have affected the results.

Secondary data were obtained from multiple sources and publications due to the difficulty of individual data collection at the global level (Babones 2007:145-146). The UNDP Data and the World Bank Data Catalog provided statistical indicators and indices,

including the HDI, GII, and the recorded number of Internet users per 100 people. Annual data for Internet users were provided from 1990 to 2012. Data for the HDI consist of 10 time points (1990, 1995, 2000, 2006-2012) and data for the GII consist of 4 time points (2000, 2005, 2010, and 2012). Annual Freedom Rating data from 1990 to 2012 were selected from the Freedom House Freedom of the World data publicly available on the organization's website. The World Values Survey Databank provided samples of countries with data on citizen's attitudes toward gender equality. Data on gender attitudes were provided for 88 countries across five waves of surveys from 1981 to 2008, but only 40 countries qualified for the analysis due to limited or missing data for select countries. I used four waves of surveys for this research study, ranging from 1990 to 2008, which allowed for analysis of 40 countries over a time span of nearly 20 years.

The Slope-Slope Model

To estimate the slope-slope model (Babones 2013), the independent and dependent variables are regressed on time within countries. The resulting slope coefficients are then used to estimate a simple cross-sectional regression model (185). The slope-slope model for this study consists of two steps:

Step 1: Regress each variable on time within countries to establish a time trend within each country,

Step 2: Regress gender attitudes slope coefficient on Internet diffusion, level of human development, level of democracy, and level of gender inequality slope coefficients for all countries, expressed by the following equations:

Step 1: For (country)_i,

$$y_i(\text{variable}) = a + b_i(\text{time}) + e_i$$

*Step 2: $coefgender_i = a + b_1 * coefusers_i + b_2 * coefhdi_i + b_3 * fhmean_i + b_4 * coefgii_i + e_i$*

where:

coefgender= slope for gender attitudes within each country

coefusers= slope for Internet diffusion within each country

coefhdi= slope for level of human development within each country

fhmean= mean level of democracy within each country

coefgii= slope for level of gender inequality within each country

Reliability, Validity, and Design Limitations

The ability to compare gender attitudes at a cross-national level was reinforced by recent findings that suggest a uniformity in the structure of gender belief system (Dorius and Alwin 2010). The authors were not concerned with specific changes in cross-national gender attitudes, but rather whether changes in the collection of attitudes are correlated with one another within countries. They used the same World Values Survey questions used in this study, which measure attitudes toward gender equality in the economic, political, and education domains, to see if attitudes changed consistently with each other. Their results confirmed a set of interrelated beliefs about gender organized around each other and furthermore indicated a converging trend in the structure of gender belief systems (Dorius and Alwin 2010). One potential concern about their findings and the findings in this study is the quality of the World Values Survey. The data from the World Values Survey cannot be reduced to the individual unit, that is, theoretical aspects are most appropriate when countries are compared with one another and not individually (Tarkhnishvili and Tevzadze 2013:98).

The data published by the UNDP and the World Bank originate from multiple sources and are often collected by agencies within each country and, accordingly, the quality of data is dependent upon the national systems of data collection (World Bank 2013b; UNDP 2013). One limitation of the available data was the limited number of countries. Not all countries were represented, and this may have undermined the results. There may be

significant differences in Internet diffusion and gender attitudes in the countries for which the data was unavailable at the time or nonexistent. I attempted to include a globally representative sample by including the standard of more than 90 percent of the world's population (Babones 2007:156). However, the sampling frame of 40 countries represented about 76 percent of the global population as a result of limited or missing data for a large number of countries. I therefore considered the consequences of the smaller sample and missing data in approaching the results and proposing valid conclusions. One final limitation to the research design was the limited number of World Values Survey waves that assess cross-national gender attitudes. Only four waves are available at the time of this study. As more waves are made publicly available by the World Values Survey, additional data points can be used to improve the analysis.

Procedure

Each variable was initially regressed on time (approximate years 1990 to 2012), creating a time trend within each country. The resulting coefficients were then used to estimate the final models. The slope of gender attitudes (coefficient) was included as the primary dependent variable. The first model estimated the effect of Internet diffusion, the primary independent variable, on changes in gender attitudes, the dependent variable, while controlling for changes in the level of human development, the level of democracy, and the level of gender inequality. To broaden the scope of analysis, the primary dependent variable was estimated as three separate dependent variables rather than as a single composite measure of gender attitudes. Thus, three dependent variables, representative of three distinct domains of gender attitudes in the public sphere, were examined: gender attitudes toward economic equality, gender attitudes toward political equality, and gender attitudes toward education equality.

RESULTS

After a time trend was established within each country, the composite variable that represents gender attitudes, as well as three separate variables that represent gender attitudes in the economic, political, and education domains, were estimated for the effect of Internet diffusion. For a list of countries and their respective time-trend variables, see Appendix A. The mean and standard deviation for all variables are summarized in Table 1.

Table 1

Mean, Standard Deviation of Eight Variables (N=40 countries)

Variable	Mean	Std. Deviation
Coefficient of Internet users (Internet diffusion)	2.71938	1.51945
Coefficient of Human Development Index (HDI)	0.00500	0.00213
Coefficient of Gender Inequality Index (GII)	-0.00696	0.00780
Mean Democracy Rating (FH)	1.60300*	0.68425
Coefficient of gender attitudes (composite)	0.00000	1.00000
Coefficient of economic gender attitudes	0.00636	0.02277
Coefficient of political gender attitudes	0.01121	0.02454
Coefficient of education gender attitudes	0.01077	0.02579

*Median of Mean Democracy Rating=1.345

Internet diffusion, the primary independent variable, displays a coefficient of about 2.7 users per 100 people. In other words, the average number of Internet users per 100 people increased by 2.7 users per year from 1990 to 2012. Not a single country shows a decrease in Internet users; Internet diffusion is evident across the entire sample of countries. Coefficients represent the slope of each variable for 23 time points, although some variables were missing data for several time points. The average coefficient for the Human Development Index (HDI) indicates an increasing level of human development in terms of life expectancy, achieved and expected years of schooling, and per capita gross national income. The average coefficient for level of gender inequality, measured by the Gender

Inequality Index (GII), indicates a decreasing level of gender inequality. In other words, losses in human development as a result of gender inequality, which the GII measures, are slowly being overcome across the sample of countries. The mean democracy rating, on average, falls between a “free” and “partly free” democracy rating, although the distribution is centered closer to a “free” democracy rating.

Changes in gender attitudes toward economic equality display an increasing level of disagreement over time with the statement, “When jobs are scarce, men should have more right to a job than women,” indicating a shift toward more egalitarian gender attitudes (i.e. changes toward egalitarianism) in regards to economic equality. Changes in gender attitudes toward political equality display an increasing level of disagreement over time with the statement, “On the whole, men make better political leaders than women do,” also indicating a shift toward more egalitarian gender attitudes in regards to political equality. Furthermore, changes in gender attitudes toward education equality display an increasing level of disagreement over time with the statement, “A university education is more important for a boy than for a girl,” indicating a shift toward more egalitarian gender attitudes in regards to education equality. The sample of countries provides supporting evidence that gender attitudes are trending toward more egalitarian attitudes in the economic, political, and education domains.

The first model estimated the effect of Internet diffusion on changes in gender attitudes toward equality. The slope-slope model failed to establish a significant relationship between Internet diffusion and the composite variable for gender attitudes when controlling for changes in the level of human development, the level of gender inequality, and the level of democracy, as shown in Table 2.

Table 2

*Regression of Slope of Gender Attitudes Toward Equality on Four Predictors
(N=40 countries)*

Variable	Coefficient	Std. Error	Sig.
Internet Diffusion (coefficient of Internet users)	.198	.853	.366
Coefficient of Human Development Index	-45.642	87.932	.607
Coefficient of Gender Inequality Index	-1.835	25.586	.945
Mean Democracy Rating	.286	.392	.470

R Square = .057

Internet diffusion does not impact changes in gender attitudes on the whole. Internet diffusion is not associated with the primary dependent variable, and we reject the first hypothesis of a significant relationship between rates of Internet diffusion and changes in gender attitudes on the whole. Thus, separate models were estimated for each domain of gender attitudes.

The second slope-slope model shown in Table 3 estimated the effect of Internet diffusion on gender attitudes toward economic equality. Figure 1 shows the relationship between Internet diffusion and gender attitudes toward economic equality. As the rate of Internet diffusion increases, there are increasingly egalitarian changes (i.e. changes toward egalitarianism) in gender attitudes toward economic equality.

Table 3

*Regression of Slope of Gender Attitudes Toward Economic Equality on Four Predictors
(N=40 countries)*

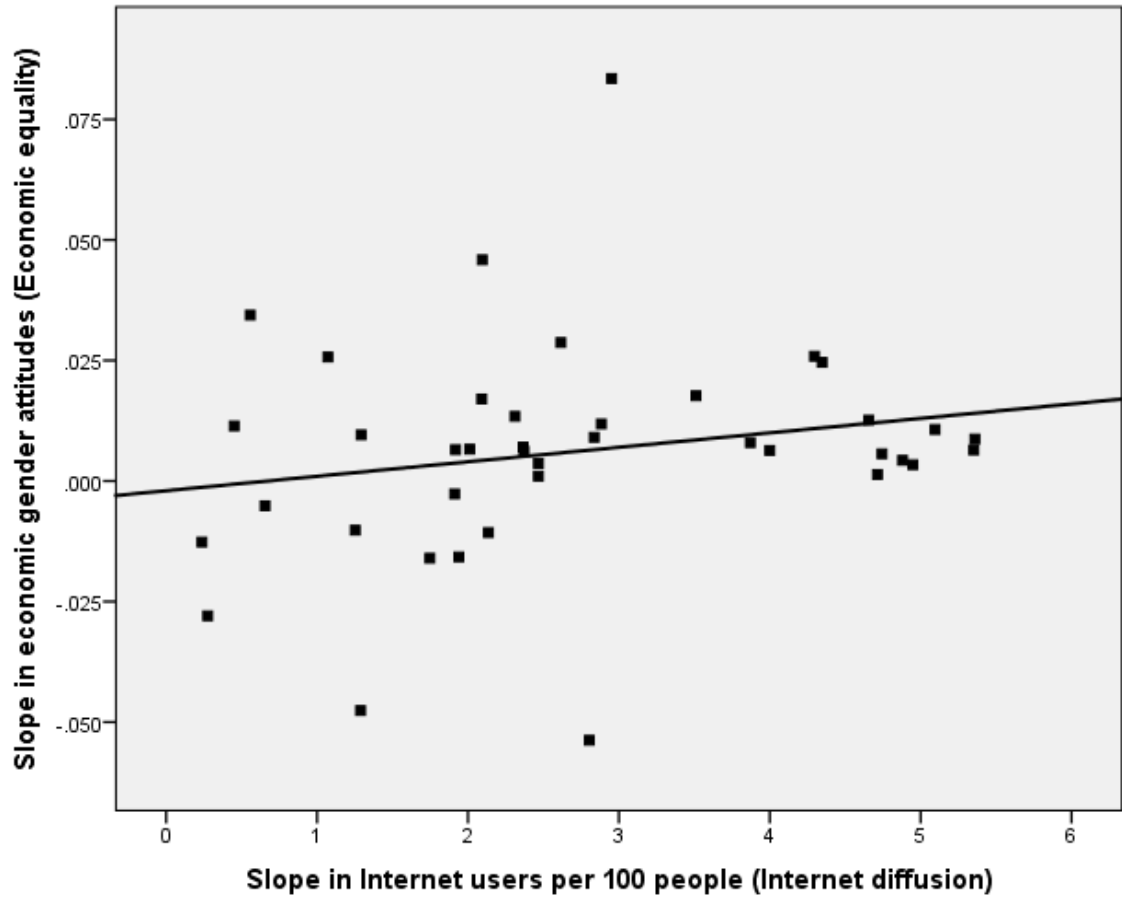
Variable	Coefficient	Std. Error	Sig.
Internet Diffusion (coefficient of Internet users)	.008	.003	.014*
Coefficient of Human Development Index	.978	1.840	.598
Coefficient of Gender Inequality Index	.338	.556	.548
Mean Democracy Rating	.018	.008	.038*

* p-value < .05; R Square = .204

Figure 1

Slope-Slope Model of the Relationship between Internet Diffusion and Economic Gender Attitudes

($N=40$ countries)



Internet diffusion is a significant positive predictor of changes in gender attitudes toward economic equality when controlling for changes in the level of human development, the level of gender inequality, and the level of democracy. As Internet diffusion increases across countries, the level of agreement decreases for the statement reflecting gender attitudes in the economic domain. For every one unit increase in the number of Internet users per 100 people, there is a .008 increase in the coefficient of gender attitudes toward economic equality. Thus, countries with higher Internet diffusion are more likely to show egalitarian changes in gender attitudes toward economic equality. Adding the phrase “toward

economic equality” to the first hypothesis that rates of Internet diffusion predict gender attitudes subsequently allowed support for the first hypothesis. Hypothesis 2a was also supported after the statement was adjusted by adding the phrase “toward economic equality,” so that citizens of countries with higher rates of Internet diffusion display more egalitarian changes in gender attitudes *toward economic equality*.

Level of democracy was also a significant predictor in the model shown in Table 3. This suggests that the political domain plays a role in egalitarian changes in gender attitudes toward economic equality. Thus, citizens of countries with higher Internet diffusion display egalitarian changes in gender attitudes toward economic equality, especially in countries with higher levels of democracy. The predictor variables for the economic domain explained about 20.4% of the variance in gender attitudes toward economic equality, a weak relationship, while Internet diffusion and mean level of democracy were statistically significant at the 95% confidence level.

The third and fourth slope-slope models indicated that Internet diffusion does not affect changes in gender attitudes for both the political and education domain. The slope-slope model failed to establish a significant relationship between Internet diffusion and gender attitudes toward political equality when controlling for changes in the level of human development, the level of gender inequality, and the level of democracy. Changes in the number of Internet users per 100 people do not predict changes in gender attitudes toward political equality, as estimated by the third slope-slope model and shown in Table 4.

Table 4

*Regression of Slope of Gender Attitudes Toward Political Equality on Four Predictors
(N=40 countries)*

Variable	Coefficient	Std. Error	Sig.
Internet Diffusion (coefficient of Internet users)	.001	.004	.883
Coefficient of Human Development Index	-1.077	2.180	.624
Coefficient of Gender Inequality Index	-.461	.659	.489
Mean Democracy Rating	-.006	.010	.569

R Square = .038

This finding is also true for the education domain. Changes in the number of Internet users do not predict changes in gender attitudes toward education equality when controlling for changes in the level of human development, the level of gender inequality, and the level of democracy, as estimated by the fourth slope-slope model and shown in Table 5.

Table 5

*Regression of Slope of Gender Attitudes Toward Education Equality on Four Predictors
(N=40 countries)*

Variable	Coefficient	Std. Error	Sig.
Internet Diffusion (coefficient of Internet users)	.005	.004	.199
Coefficient of Human Development Index	-2.319	2.247	.309
Coefficient of Gender Inequality Index	.103	.679	.880
Mean Democracy Rating	.008	.010	.413

R Square = .075

The three gender attitudinal variables that formed the composite variable of gender attitudes are highly correlated with one another, which denotes that the variables are aspects of a common concept. However, the composite model of gender attitudes failed to show statistical significance when estimating the effect of Internet diffusion. The model capturing the economic domain of gender attitudes revealed a significant relationship while the models

capturing the political domain and education domain of gender attitudes remained non-significant. The fact that the model shown in Table 3 was the only model to establish statistical significance suggested that the model was possibly capturing something more than gender attitudes toward economic equality.

In short, Internet diffusion does not affect changes in gender attitudes on the whole. When the composite measure of gender attitudes is broken down into three distinct dependent variables, a significant positive relationship is found for the economic domain, and may signify that the model is measuring beyond gender attitudes toward economic equality. Internet diffusion is positively associated with egalitarian changes in gender attitudes toward economic equality, although the relationship was weak. Countries with higher rates of Internet diffusion display more egalitarian changes in gender attitudes toward economic equality, especially in countries with higher levels of democracy. Economic equality was characterized by the level of agreement or disagreement with the statement that men should have more right to a job than women when jobs are scarce (i.e. gender attitudes toward economic equality). The results show a positive change in attitudes, which indicate a lower agreement with the statement that men should have more right to a job when jobs are scarce. In other words, there is a trend toward neutrality and disagreement to the notion that men are more entitled to work than women, at least in countries with higher rates of Internet diffusion and higher levels of democracy.

DISCUSSION

The research findings indicate that the diffusion of the Internet hinders attitudes that males have more right to jobs than females. As the rate of Internet diffusion increases, fewer people agree that men are more entitled to work than women. In one sense, this is consistent with the conclusions proposed in the World Bank Development Report on Gender and Equality (2011). Information and communication technologies, including the Internet, expand economic opportunities for women globally, and the World Bank report suggests that higher levels of exposure to the roles women play in other countries may over time affect actual gender roles and outcomes (World Bank 2011:268). Although this study does not insist that actual gender inequalities are eradicated by the diffusion of the Internet, previous research shows that global norms and international influence improve outcomes for women and equality (Gray et al. 2006). The findings are also in line with the similar research of Nisbet et al. (2012) and Groshek (2009), given that higher rates of Internet diffusion predict egalitarian changes in attitudes, and that the effect is greater as the level of democracy increases. Nisbet et al. (2012) found a relationship between individual Internet use and citizen demand for democracy, and that the relationship is more meaningful in democracies, especially young or new democracies. Although their results were significant at the individual-level in terms of Internet use, the conclusions drawn are similar in content. Likewise, Groshek (2009) found that the Internet produces democratic effects in democracies while the effects are severely limited in non-democratic countries (128). At the very least, the findings of this study show that attitudes are affected on at least one dimension, and that this may improve economic gender inequality by proxy. Hilbert (2011) conceived of a “vicious cycle” revolving around digital exclusion and unemployment among other things, and that this cycle is propelled by longstanding inequalities (487). As access to

ICTs and the Internet improves, the cycle can be reversed, but then the problem becomes how to improve opportunities to access ICTs and the Internet (Hilbert 2011). Accordingly, the diffusion of the Internet is likely reversing this vicious cycle already by reconciling traditional beliefs that contribute to longstanding inequalities today. With this in mind, improving access in general may be an effective method of eradicating inequalities as well.

If attitudes toward economic gender equality are affected by Internet diffusion, as the findings of this study direct us toward, then the diffusion of the Internet may indirectly breakdown systems of gender oppression by influencing our conceptions of the roles of females and males in the economic domain. By affecting these conceptions, Internet diffusion may provide women the opportunity to break through inequalities inherent to the structure of the society in which they live. The trend of gender attitudes toward a more egalitarian right to work, especially in countries with higher levels of democracy, and the increase in economic opportunities for women, can be viewed as an occurrence mediated by the Internet and relatedly the diffusion of the Internet.

The Paradox of the Internet

The “paradox of the Internet,” however, must be recognized before liberating conclusions are drawn (Foster and McChesney 2011). If the diffusion of the Internet affects how people view work and economic equality, in terms of gender and equal right to jobs, how certain can one be that this is, in general, a good thing? The Internet and its diffusion are not immune to the capital accumulation process (Foster and McChesney 2011:3). In this light, we must consider whether beliefs in economic equality are supplemented by capitalist society and mediated by the diffusion of the Internet. The facets of the capitalist world economy leave women no choice but to enter the economy as workers, perhaps in a liaison with the diffusion of the Internet. The diffusion of the Internet, undermined by the capitalist

world economy, might be one of the many mechanisms that influence our conceptions of the roles of females and males in the economic domain.

The findings in this study suggest that Internet diffusion links to egalitarian attitudes toward gender equality in the economic domain (i.e. equal right to a job). The real question at hand is why the diffusion of the Internet links to egalitarian changes in gender attitudes toward economic equality. One might speculate that something about the Internet is liberating due to egalitarian changes in gender attitudes toward beliefs in the equal right to job. Yet, one might speculate that something about the Internet is reifying oppressions since egalitarian changes in gender attitudes are evident for economic equality, but not political or education equality. Achieving greater economic equality may have nothing to do with equality itself, but rather is a reification of economic oppression in terms of the capitalist world economy. In other words, changes in gender attitudes toward economic equality may not be about gender equality per se. Instead, egalitarian changes may reflect the increase in economic opportunities supplemented by the global demand for labor in the world economy and the changing roles of females and males in the economic domain. Regardless, something about Internet diffusion hinders the belief that males have more right to jobs than females, but not beliefs about gender in terms of political and education equality. Green and Singleton's (2013) mixed interpretations of digital technology, in terms of gender, are congruent with the findings of this study. The Internet is neither a liberating medium nor is it an oppressive technology, as cyber optimists and cyber pessimists claim in their two-sided struggle, but rather it is probable that the Internet is a liberating *and* oppressive medium and technology in terms of gender and in general.

Limitations and Future Research

This study is limited by several circumstances. Internet users, as defined and measured by the International Telecommunication Union and World Bank, is a broad concept with multiple operational disadvantages. First, neither frequency of use nor length of use are differentiated among Internet users. Individuals who used the Internet once in the past 12 months are equal to those who used the Internet every day. Likewise, individuals who used the Internet for a few minutes per session are equal to those who used the Internet for many hours per session. Another limitation is the measurement of gender ideology. Davis and Greenstein (2009) noted that the majority of research studies examining gender ideologies have used similar methodologies consisting of respondents answering a series of agreement and disagreement statements and, whether appropriate or not, researchers continue to establish time trends and factors that influence gender ideologies (89-90). As discussed, reported attitudes may not be the most reliable account of conceptions about gender. Other research methods beyond close-ended questions may improve understandings of how others conceive of gender and the roles of females and males.

Although many factors contribute to variances in gender attitude change, the objective for this study is to relate Internet diffusion with changes in gender attitudes. The generalizability of this study may be considered low due to the inclusive definition of Internet users, the broad nature of gender ideologies, and the weak estimated relationship. However, numerous precautions were taken to help limit potential spurious relationships between the independent and dependent variables. The range of factors accounted for and measured by the control variables, combined with the innovative and allegedly statistically

powerful slope-slope model proposed by Babones (2013), increase the validity of this study and the associated results.

Future research should incorporate additional data published by the World Values Survey in effort to include as many countries as possible. In conjunction with the slope-slope model, the greater number of data points further improves the estimated slopes (Babones 2013:185). A secondary objective of this study is to implement the slope-slope model as a new quantitative macro-comparative research design. Based on the successful application of the slope-slope model and the associated results, this research supports a new research design that may be useful in future research. To validate the results estimated by the slope-slope model and test its implications, future studies should use a series of different models as a comparison to the slope-slope model. If the slope-slope model is a new way forward in quantitative macro-comparative research, then all efforts should be made to test its usability. One suggestion is to construct models that better reflect the factors that may influence gender attitudes since the models in this study reported weak relationships. In terms of the research question, future research should focus around case studies on the influence of the Internet on knowledge, thoughts, attitudes, beliefs, and behavior in everyday life. To explore this possible route, qualitative methodologies may be useful and complementary to quantitative macro-comparative research. Ideally, a mixed methods approach would serve as the best sociological tool to exploring how the Internet may be changing our world.

What ought to be investigated in the near future is how the Internet, as an entity in itself, is experienced by individuals, whether they are avid users or nonusers barred by economic and social barriers that continually prevent or deny access. Specifically, research should examine the meanings that are placed on the Internet over time as its rapid diffusion begins to play an increasingly important role in everyday life. Although some might say that

the diffusion of the Internet is becoming an important aspect of everyday life for a third of the world, I would argue that the remaining two-thirds are equally affected by the diffusion of the Internet. Indeed, a typology of Internet users has already been compiled, with a prominent focus on one's socialization, gender, personal environment, and social position (i.e. habitus; Bourdieu 1984) as indicative of the use, ability to use, and relevance of the Internet in everyday life (Meyen, Pfaff-Rüdiger, Dudenhöffer, and Huss 2010:880). Thus, one might be inclined to explore how the Internet affects those who elect to not use, are deprived of use, or are oblivious to use of the Internet. At the very least, this study shows that there are implications, even if paradoxical, from the diffusion of the Internet. Regardless of who is affected, and to what degree, it appears that in any case, certain groups are likely to be disadvantaged - an observation worthy of further diagnosis.

APPENDIX A

Sample of Countries and Variables with Time-Trend Data

Country	Coefficients (Slope)							
	Users	HDI	GII	FH	Job	Politic	Educ	Gender
Albania	2.62	0.0042	-0.0113	2.04	0.0287	0.0269	0.0263	0.86
Argentina	2.47	0.0051	-0.0034	1.09	0.0036	0.0121	0.0151	0.05
Australia	4.35	0.0026	-0.0030	1.00	0.0246	0.0009	0.0159	0.15
Bangladesh	0.28	0.0072	-0.0100	1.91	-0.0280	-0.0243	-0.0571	-2.27
Bulgaria	2.84	0.0039	-0.0008	1.04	0.0091	0.0293	0.0198	0.52
Brazil	2.37	0.0064	-0.0059	1.39	0.0062	0.0193	-0.0099	-0.21
Canada	4.74	0.0022	-0.0026	1.00	0.0056	0.0028	-0.0031	-0.40
Chile	2.88	0.0055	-0.0066	1.00	0.0118	-0.0005	-0.0158	-0.59
China	1.92	0.0096	-0.0289	3.00	0.0065	-0.0002	-0.0018	-0.42
Germany	4.88	0.0054	-0.0046	1.00	0.0043	0.0019	0.0026	-0.33
Egypt	1.91	0.0074	-0.0054	2.83	-0.0027	-0.0513	-0.0340	-2.01
Spain	3.87	0.0058	-0.0012	1.00	0.0080	0.0319	0.0328	0.77
Finland	4.95	0.0044	-0.0015	1.00	0.0034	-0.0158	-0.0140	-0.95
Indonesia	0.66	0.0070	-0.0083	1.87	-0.0051	-0.0135	-0.0187	-1.11
India	0.45	0.0069	-0.0038	1.30	0.0114	-0.0222	-0.0289	-1.21
Iran	1.07	0.0093	-0.0092	3.00	0.0257	-0.0226	-0.0365	-1.15
Iraq	0.24	0.0035	-0.0369	3.00	-0.0127	0.0021	0.0074	-0.48
Jordan	1.94	0.0052	-0.0136	2.17	-0.0157	0.0487	0.0145	0.43
Japan	4.66	0.0034	-0.0011	1.00	0.0126	0.0206	0.0196	0.41
Korea Rep.	5.10	0.0074	0.0039	1.00	0.0107	0.0165	0.0270	0.43

Morocco	2.95	0.0072	-0.0184	2.00	0.0835	0.0706	0.0446	2.71
Moldova	2.09	0.0011	-0.0006	2.00	0.0170	0.0262	0.0290	0.73
Mexico	1.75	0.0055	-0.0085	1.57	-0.0160	0.0231	0.0107	-0.10
Norway	5.35	0.0046	-0.0031	1.00	0.0064	0.0040	0.0203	0.04
New Zealand	4.71	0.0038	-0.0017	1.00	0.0013	0.0043	0.0092	-0.22
Pakistan	0.56	0.0067	-0.0072	2.39	0.0344	0.0606	0.0518	1.97
Peru	2.14	0.0056	-0.0086	1.48	-0.0107	0.0171	0.0251	0.12
Philippines	1.29	0.0034	-0.0049	1.61	-0.0476	-0.0292	-0.0071	-1.77
Poland	3.51	0.0037	-0.0048	1.00	0.0177	0.0294	0.0289	0.79
Romania	2.47	0.0044	-0.0020	1.30	0.0010	0.0572	0.0611	1.61
Russian Fed.	2.31	0.0033	-0.0090	2.41	0.0134	-0.0032	0.0143	-0.10
Slovenia	4.00	0.0041	-0.0127	1.00	0.0063	0.0225	0.0237	0.42
Sweden	5.36	0.0039	-0.0018	1.00	0.0087	-0.0018	-0.0099	-0.56
Turkey	2.37	0.0072	-0.0209	2.00	0.0070	0.0053	0.0273	0.19
Ukraine	1.29	0.0019	-0.0025	1.77	0.0096	0.0194	0.0102	0.18
Uruguay	2.80	0.0045	-0.0035	1.00	-0.0538	0.0289	0.0092	-0.54
United States	4.30	0.0027	-0.0037	1.00	0.0259	0.0099	0.0162	0.34
Venezuela	2.01	0.0057	-0.0012	1.78	0.0066	0.0133	0.0618	0.92
Vietnam	2.09	0.0082	-0.0044	3.00	0.0459	0.0177	0.0425	1.20
South Africa	1.25	0.0001	-0.0050	1.17	-0.0102	0.0103	0.0006	-0.42

APPENDIX B

WESTERN MICHIGAN UNIVERSITY



Human Subjects Institutional Review Board

Date: March 12, 2014

To: Paul Ciccantell, Principal Investigator
Robert Roznowski, Student Investigator for thesis

From: Amy Naugle, Ph.D., Chair 

Re: HSIRB Project Number 14-03-14

This letter will serve as confirmation that your research project titled "Diffusion of the Internet and its Effect on Gender Attitudes: A Cross-national Approach" has been **approved** under the **exempt** category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note: This research may **only** be conducted exactly in the form it was approved. You must seek specific board approval for any changes in this project (e.g., ***you must request a post approval change to enroll subjects beyond the number stated in your application under "Number of subjects you want to complete the study."*** Failure to obtain approval for changes will result in a protocol deviation. In addition, if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

Reapproval of the project is required if it extends beyond the termination date stated below.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: March 11, 2015

251 W. Walwood Hall, Kalamazoo, MI 49008-5456
PHONE: (269) 387-8293 FAX: (269) 387-8276

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