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Breaking Down Barriers of Space: Correlations and Connections between Online Social Capital, Offline Social Capital, Community Attachment, and Community Satisfaction

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ABSTRACT

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With Internet access and use becoming nearly ubiquitous aspects of an individual's experience of everyday life, sociologists must consider how the Internet is transforming an individual's experience of community. This study examines the connections between place-independent forms of social capital actuated online, place-dependent forms of social capital actuated face-to-face, and individuals' perceptions of community attachment and community satisfaction. Moving from a theoretical foundation to empirical evidence, I show the concepts of bonding and bridging social capital can and should be divided based upon the medium through which they are actuated. I then explore the effect of online and offline forms of bonding and bridging social capital on individuals' perceptions of community attachment and community satisfaction. Based on data from 52 communities in Montana, collected in 2012, the results indicate that a significant distinction exists between online and offline social capital and that online social capital is capable, to a limited degree, of ameliorating some of the consequences of geographic isolation, or distance, experienced by many residents of rural communities. The results also indicate that while online actuations of social capital are statistically and substantively important in explaining individuals' perceptions of community, offline actuations of social capital are associated with larger substantive impacts on individuals' perceptions of community attachment and community satisfaction, suggesting that while online social capital is an important part of how individuals experience community, face-to-face, or offline actuations of social capital are more important in determining how individuals perceive the geographically fixed communities in which they reside.

Keywords: community attachment, community satisfaction, social capital, Internet, place

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INTRODUCTION

Throughout a large portion of the world, and particularly within the United States of America, Internet access and use has become a nearly ubiquitous trait of daily life. Internet access is also available to more people than ever before. By June 2011 all US Census tracts were covered by some form of Internet access and 67 percent of American households had unique in-home Internet connections. From 2001 to 2011 residential Internet connections grew at a consistent rate of 26 percent per year (U.S. Federal Communication Commission 2012), and there is little evidence to suggest that that rate has done anything but increase since. As Internet coverage and use increase, the question that must be asked is: what impact is increased Internet use for common daily activities having on individuals' perceptions of the offline social world in which they reside? While the impact of increased Internet access and use is wide and varying, this study explores a specific set of questions concerning the relationship between social capital, the medium through which it is actuated, whether online or offline, and the relationship between online and offline social capital and community satisfaction and community attachment. The reason for this consideration is that, if the actuation of social capital online results in the creation of a new form of social capital, it may be possible for this new form of social capital to ameliorate some of the consequences of geographic distance felt by many residents of isolated communities.

In this paper I seek to add to the current discussion by: 1) building a case for the existence of online social capital as separate and distinct from offline, or face-to-face, social capital, 2) investigating the relationships between online social capital, offline social capital, and community satisfaction, 3) investigating those same relationships with regards to community attachment, and 4) considering how those impacts vary based on community type: urban, rural,

and highly rural. To address these questions I use data gathered from 52 communities in Montana as part of the Montana Health Matters Follow-up survey conducted in 2012, and decompose both online and offline social capital into bonding and bridging social capital (Putnam 2000). The emphasis on a highly rural setting, Montana, was chosen because of the unique impacts the Internet carries as a distance demolishing technology (Scott 2009:11) for geographically isolated communities and the individuals that reside in them. Furthermore, if it can be shown that online social capital is distinguishable from offline social capital in urban, rural, and highly rural communities in Montana, then, theoretically, it should follow that the same distinction exists in other communities where Internet access has been available longer and it use is more entrench in the activities of everyday life.

COMMUNTIY ATTACHMENT AND COMMUNTIY SATISFACTION

Although often treated as conceptually synonymous (Brown 1993; Goudy 1982; Kasarda and Janowitz 1974; Landale and Guest 1985), community attachment and community satisfaction should be viewed as separate and distinct phenomenon (Brown, Xu, Barfield, and King 2000; Erickson, Call, and Brown 2012; Flaherty and Brown 2010; Theodori 2001; 2004). Community attachment is contextualized in terms of locality, suggesting a "rootedness" to place (Theodori and Luloff 2000; Brown et al. 2000; Erickson et al. 2012), and as such is indicative of an individual's experience of community vis-à-vis physical locality. To this extent, community attachment reflects the degree to which an individual integrates within-community social networks into their perception of self (Erickson et al. 2012). Community satisfaction, on the other hand, captures the feeling of an individual's standing in society generally as enacted in a physical locality specifically (Brown 1993; Brown et al. 2000; Erickson et al. 2012; Tuan 1977). Community satisfaction thus reflects an individual's belief that the place-dependent community

in which she or he resides facilitates his or her successful participation in a larger mass-consumer society (Brown 1993; Erickson et al. 2012).

In examining individuals' perceptions of community as expressed through community attachment and community satisfaction, it is important to remember that human beings seek to make place out of space by giving the spaces they occupy meaning (Tuan 1977:17-18).This transformation from space into place requires the formation of relationships between individuals, between individuals and groups or other organizations, and eventually between individuals and other communities (Anderson 2006), all of which are important factors of social capital. Consequently, the concept of social capital is strongly related to individuals' perceptions of community attachment and community satisfaction, but a distinction between the two concepts is still warranted (Besser 2009; Agnitsch et al. 2006).

Despite connections to social capital, the concepts of community attachment and community satisfaction are not social capital, nor is social capital community attachment or community satisfaction. The variables used to measure community attachment and community satisfaction have a long tradition in the community literature (Brown 1993; Brown et al. 2000; Erickson et al. 2012; Flaherty and Brown 2010; Theodori 2001; 2004; Theodori and Luloff 2000) that identifies them as distinct from the concepts of social capital. Consequently, a consideration of how various forms of social capital affect individuals' perceptions of community attachment and community satisfaction can be undertaken without becoming tautological.

SOCIAL CAPITAL

Unfortunately a singular definition of social capital does not exist, but the concept of social capital can be traced back to some principal foundations. Most well-known amongst those is Bourdieu’s (1980, 1986) conceptualization of social capital as a resource that arises from

individual relationships, or simply interactions between individuals. Coleman (1988) defines social capital as the productive structure of relationships both at the group and individual level. Putnam (2000) defines the concept as norms and values imbedded in social networks. Putnam's (2000) discussion of social capital popularized the concept by suggesting that a lack of social capital was at the heart of the decline of American communities. Ostrom and Ahn (2003:3) define social capital as an attribute of individuals and their relationships formed around trustworthiness, networks, and formal and informal rules or institutions. More recently, Parcel, Dufur, and Zito (2010: 830) define social capital as "resources that inhere in the relationships between and among actors that facilitate a range of social outcomes."

Since its introduction, research exploring social capital in a variety of forms abounded, such that within the ten year period from 1991 to 2001 the reported citations of social capital in the Humanities, Social Sciences, and General Sciences using the Web of Science Citation Indices, increased from 2 in 1991 to 220 in 2001 (Ostrom and Ahn 2003). Yet, despite the abundant use of the term, a concrete definition of the concept remains elusive. Li and Westlund (2013:184) sum up the vague state of a general definition of social capital succinctly: “The problem was that the concept was not very clear from the beginning – and with increasing use of it in public debates it sometimes became a rather fuzzy, all-embracing concept.”

Consequently, to investigate the effects of social capital generally is ill advised; instead attempts at empirical investigations of social capital should select specifics aspect of social capital for study (Eliasson, Westlund, and Fölster2013). In this paper social capital is divided into two commonly used subcategories: bonding and bridging social capital (Putnam 2000), or what Granovetter (1973) identifies as strong and weak ties. Beyond overcoming many of the pitfalls inherent in generalized measures of social capital, the division of social capital into

bonding and bridging forms allows for a more detailed analysis of differences between online and offline social capital and their respective impacts on individuals' perceptions of community.

Bonding and Bridging Social Capital

The division of social capital into bonding and bridging relations is based on the types of social connections experienced by an individual and the strength of the ties inherent in those relationships. Bonding social capital is representative of the internal network of a group or organization and social norms and common values that hold the group together (Westlund and Kobayashi 2013). These types of relations are most often associated with familial ties, relationships based on close friendship, and other relationships founded on general, all-encompassing, trust. This does not suggest that bonding social capital is the sole characteristic of such relationships, but that bonding social capital is representative of a specific type of social connection between members of these groups. Bridging social capital, on the other hand, provides a link to individuals, groups, and other organizations outside of an individual's bonding relations. These types of connections encompass social relationships based on trust limited to specific ends which are often professionalized, longstanding, and renewable (Westin and Zola 2013). The name “bridging” social capital stems from the idea that these relations allow individuals to bridge across interests, resources, geographic space, and groups otherwise inaccessible within their bonding relations.

Online vs. Offline Social Capital

While the first series of debates concerning the intersection of society and the Internet were divided upon lines of utopian versus dystopian views of an information society (Miyataand Kobayashi 2008), the majority of contemporary research among social scientists concerning the intersection of society and the Internet is oriented more toward an investigation of the impacts of

specific uses of the Internet in daily life (DiMaggio, Hargittai, Neuman, and Robsinson 2001). While there are many ways and interactions to consider, Malecki (2003:202) finds that Americans are going digital, or increasing their use of the Internet in everyday life, more for social reasons than for economic ones, suggesting that links between social capital and increased Internet use may be more pronounced than many of the other uses individuals find for the Internet in their daily routines. Following Malecki (2003), the first stages of analysis within this study seek to identify if increased Internet use for social means is creating new and distinct forms of social capital.

In a review of the literature, Huysman and Wulf (2004) found that the concept of social capital receives comparatively little application in studies focusing on the intersection of society and increased Internet use than concepts such as human capital or economic activity. In another overview of the literature, Mesch and Talmud (2010) found that the majority of work investigating the connections between the Internet and society lacked an accounting of possible mechanisms linking Internet use and social capital. This failing may be due in part to the complexity or fuzziness of social capital as a concept or simply a lack of data, but no matter the reason, further investigation is needed.

Unfortunately, studies that do address the impact of increased Internet use on social capital yield varying results, leading to inconsistencies in the interpretation of how the Internet functions with regards to social capital. Kraut Patterson, Lundmark, Kiesler, Mukopadhyay, and Scherlis (1998) suggest that increased Internet use leads to the substitution of strong ties with weak ties, while a latter study by Kraut, Kiesler, Boneva, Cummings, Helgeson and Crawford (2002) found that increased Internet use leads to higher levels of strong and weak ties, suggesting a complementary relationship between higher levels of Internet use in daily life and social

capital. Similarly, Penard and Poussing (2010) fail to identify a single directionality in the relationship between increased Internet use and social capital, and instead suggest a variety of possible outcomes ranging from maintaining/intensifying current social ties to creating an unbalanced proportion of weak ties. Quan-Haase and Wellman (2004), on the other hand, go beyond trying to link the effects of increased Internet use on social capital and suggest that the incorporation of Internet use into everyday life leads to the creation of new forms of social capital which require the development of measures distinct from those used to identify offline social capital.

Despite inconsistencies, the majority of the contemporary discussion concerning the effects of increased Internet use on social capital can be summarized into two basic findings: 1) the Internet acts as a complement and/or supplement to offline, or face-to-face, social capital, and 2) increased Internet use by individuals causes a decline in the actuation of offline social capital generally (Quan-Haase and Wellman 2004:116). The later finding is supportive of Putnam's (2000) arguments that social capital is declining and that increased Internet use is accelerating its decline. But, there are many scholars who believe that Putnam's (1995) claim that social capital is in decline is overstated (see for example Fischer 2005 and Paxton 1999), especially with regards to the effects of increased Internet use on the suggested decline.

While a few researchers may still share Putnam's (2000) perspective that increased Internet use is causing at least part of his hypothesized decline in social capital, that argument represents a minority opinion in the contemporary conversation. The majority of empirical evidence on the topic does not support Putnam's (2000) claim. In fact current research suggests that the Internet, among other information communication technologies, is more liberating of community boundaries (see for example Gilleard, Hyde, and Higgs 2007:S276), and by

connection social capital, than destructive of social capital. These findings imply that increased internet use is not a corrosive force eroding offline social capital, but instead, that online interactions and networks, here termed online social capital, serve as a complement to their offline counterparts.

Blanchard (2004:71) found that for individuals active in their face-to-face communities and at least one online community their attachment, and obligation, to their face-to-face relations always received priority, suggesting that online social capital serves as a compliment to offline social capital. Similarly, Wellman, Quan-Hasse, Witte, and Hampton (2001), found that online social capital supplements offline social capital and increases individuals' sense of community both online and offline. Through a general review of the literature and their own findings Quan-Hasse and Wellman (2004) argue that increases in online social capital, particularly through email use, are correlated with increases in social interactions through other mediums, including face-to-face interactions. Quan-Hasse and Wellman (2004) summarize their findings by suggesting that Internet use in everyday life is adding to, rather than diminishing offline social. Similarly, Penard and Pousing (2010) find that investments in online social capital are strongly associated with increases in active participation in face-to-face associations. Furthermore, Penard and Pousing (2010) found that the higher an individual's level of offline social capital the more willing they were to invest in online social capital; investments which in turn increased offline social capital, creating a cyclical relationship between online and offline social capital. I hypothesize that online social capital maintains a complementary and/or supplementary relationship with offline social capital and by extensions that online forms of bonding and bridging social capital will follow the same directionality in their effects on individuals' attachment to and satisfaction with the communities in which they reside. But, before such an

analysis is undertaken, what remains to be fully explored is whether the observed complementarities between increased Internet use and social capital represent increases in the same general type of social capital or if the actuation of social capital online produces a new form of social capital requiring its measurement as distinct and separate from offline social capital (Quan-Haase and Wellman 2004).

Despite the apparent mutualism in the relationship between online and offline social capital, it should not be assumed a priori that access to, and the accumulation of, online social capital affects individuals and their perceptions of community in exactly the same ways as offline social capital. Even with an assumption of a positive feedback loop between offline and online social capital (Blanchard 2004; Dutta-Bergman 2006), investigating if, and to what degree, a distinction between online and offline social capital should be made must be a priority (Quan-Hasse and Wellman 2004). Yet, despite the continued call for further investigation into the differences between offline and online social capital, questions concerning how the medium of actuation modifies social capital have yet to be fully explored (Mesch and Talmud 2010).

Within this study I explicitly test Quan-Haase and Wellman's (2004) suggestion that increased use of the Internet in the everyday lives of individuals creates a new form of social capital that, unlike its offline counterpart, is not restricted by geographical space. Put differently, I hypothesize that the actuation of social capital type relations via the Internet necessitates the establishment of new measures of social capital in order to appropriately capture the effects of social capital expressed through a place-independent medium. Yet, while pursing the identification of this new type of social capital actuated via the Internet, it is important that the same mistakes of overly generalized definitions of social capital are not perpetuated. Thus, I use

the further distinctions of online-bonding and online-bridging social capital vs. offline-bonding and offline-bridging social capital.

Online-bonding and Online-bridging Social Capital

In his study of the effects of increased Internet use on social ties, Zhao (2006) identifies three broad categories of Internet use that are helpful in considering the creation of new forms of social capital actuated through the Internet that go beyond generalized measures of social capital and suggest specific mechanisms through which social capital actuated via the Internet functions. The three categories of Internet use identified by Zhao (2006) are: 1) nonsocial, 2) social use for current ties, and 3) social use for unacquainted ties. It is true that these three categories represent a mere fraction of possible uses of the Internet by individuals, but while recognizing the nonsocial aspects of Internet use, which are admittedly vast, Zhao's (2006) categories are suggestive of a further distinction within the concept of online social capital: namely, the division of online social capital into bonding and bridging relations.

Developing the concepts of online, or place-independent, -bonding and -bridging social capital as distinct from offline, or place-dependent, -bonding and -bridging social capital requires that the concepts be grounded upon similar theoretical foundations while differing enough to account for the two forms of actuation. As explained previously social capital is often divided into two subgroups, namely: bonding and bridging social capita, where bonding social capital is representative of social relations dependent on high levels of general trust and friendship while bridging social capital is representative of relationships based on trust limited to specific ends. The application of these concepts to the actuation of social capital via the Internet follows those same distinctions while simply applying the further restriction that contact/communication be actuated through the Internet. This restriction does not imply that online social capital is based

solely on relationships initiated online, but instead that online social capital represents the actuation of any relationship via the medium of the Internet. For example, communicating with a relative or close friend who no longer resides in the same physical community as the hypothetical actor in the example via the Internet constitutes one aspect of online-bonding social capital; while using the internet to purchase a good or service, search for medical information, or find details about local events are forms of online-bridging social capital (Stern and Adams 2010). In the inverse, this implies that offline-bonding and offline-bridging social capital are representative of an actuation of bonding and bridging relations via face-to-face, or place-dependent, interactions. In this way online social capital captures the place-independent nature of interactions enacted via the Internet, while offline social capital is constrained by the physical location of both actors such that they must interact face-to-face.

The conceptualization of online social capital as based upon the place-independent interactions of individuals allows for the "distance demolishing" (Scott 2009:11) properties the Internet provides to be captured within the concept. Huysman and Wulf (2004:19) give evidence in support of the distance demolishing characteristics of the Internet through examples of its usefulness in connecting individuals and groups physically located in geographically distant communities. Yet, despite the distance demolishing nature of the Internet, the length of the distance the Internet mitigates does not by necessity have to be insurmountable per the resources of the individual to physically travel to the location of the actor she/he desires to contact. In short, the Internet is not solely used to communicate with individuals, groups, or organizations who are otherwise geographically inaccessible, it also helps to connect individuals to other people, groups, and organization residing within the same physical communities in which they reside. As such the Internet can serve to increase homogenous social ties as well as facilitate the

actuation of heterogeneous ties between individuals, groups, and other organizations within and across communities. Put differently, online social capital can increase bonding and bridging social capital within and across communities, by increasing an individual's access to otherwise geographically inaccessible communities, organizations, groups, and individuals, and by increasing the available means through which individuals actuate social capital with other individuals, groups, and organizations within their physical communities.

By combining the benefits of conceptualizing social Internet use as bifurcated upon the lines of bonding and bridging social capital (Zhao 2006) with the idea that the intersection of increased Internet use for social means requires the development of new measures of social capital (Quan-Haase and Wellman 2004), I hypothesize that online-bonding and online-bridging social capital can be identified as separate and distinct structures apart from offline-bonding and offline-bridging social capital. In order to show that for measures of online-bonding and -bridging social capital differ from measures of offline-bonding and -bridging social capital it must be the case that the configural formation of online social capital varies from that of offline social capital and that the structural impact of online social capital differs from that of offline social capital in the models of community attachment and community satisfaction tested in this study. Put differently, the use, access, and expression of social capital through the medium of the Internet must modify the structure of social capital sufficiently to justify a new measurement of social capital specific to the expression of social capital via the Internet.

To examine the empirical distinction between online and offline social capital I follow a process of exploratory factor analysis, confirmatory factor analysis, full structural equation modeling, and finally tests of discriminant validity. The theoretical foundations upon which

considering the effects of online social capital on individuals' perceptions of community attachment and community satisfaction are discussed in the next section.

Definitions of Online-bonding, Online-bridging, Offline-bonding, and Offline-bridging Social Capital

Within this study social capital is divided into four separate conceptual constructs: online-bonding, online-bridging, offline-bonding, and offline-bridging social capital. The definitions of online social capital represent a quantitative measurement of social capital via an enumeration of social contact through the medium of the Internet (Stern and Adams 2010), while the definitions of offline social capital reflect a more qualitative measurement of social capital via individuals perceptions of others within their community (Agnitsch, Flora, and Ryan 2006, Besser 2009). As explained above the use of a quantitative construction of online social capital is due to the inherent difficulty and measurement error associated with attempting to capture a qualitative definition of social capital actuated via the Internet. The exact definitions of online social capital listed below thus reflect the quantitative measurement of social capital used by (Stern and Adams 2010). Conversely, the definitions of offline social capital outlined below follow a qualitative measurement of social capital as espoused by Agnitsch et al. (2006) and Besser (2009).

Offline-bonding social capital: Individuals' perceptions of general trust, friendship, and reciprocity within their place-dependent communities.

Offline-bridging social capital: Individuals' perceptions of the general actuation of social relationships based on trust limited to specific ends within their place-dependent communities.

Online-bonding social capital: The actuation of social relationships within an individual's

internal network dependent on high levels of general trust and friendship (i.e. family and close friends) through the place-independent medium of the Internet.

Online-bridging social capital: The actuation of social relationships based on trust limited to specific ends that serve to link individuals to other individuals, groups, or organizations outside of their bonding relations through the place-independent medium of the Internet.

RURAL COMMUNITIES AND ONLINE-BONDING AND ONLINE-BRIDGING SOCIAL CAPITAL

Given the link to a place-dependent community inherent in the concepts of community attachment and community satisfaction, I seek to explore if, and to what degree, online social capital can ameliorate some of the consequences of geographic and social isolation experienced by many residents of rural communities. This section outlines a few of the theoretical reasons supporting this line of inquiry.

Human beings seek to make place out of space by giving it meaning (Tuan 1977:17-18), consequently when I identify place-dependent and place-independent means of expressing social capital it is inherent in the argument that meaning exists in both the place-dependent and place-independent forms of social capital simultaneously. Community is a space that has been given meaning, hence becoming a place in the minds of individuals, but communities are not isolated in either geographic or human contexts; they exist contemporaneously in the minds of individuals with other groups, organizations, and places. As a result, individuals are capable of becoming attached to places of enormous size such as a nation-state, despite the fact that they may have limited knowledge of the entirety of the space (Anderson 2006; Tuan 1977:18).

Tuan's argument for the ability of individuals to become attached to places of enormous size is one of the links through which an individual's use of the Internet as a place-independent

medium for the actuation of social capital type associations, despite a limited knowledge of the entirety of the space covered by Internet communications, can be contextualized as a meaning making mechanism independent of where either the sender or receiver of such relationships are geographically located. Depending on the type of network the individual is accessing, either online-bonding or online-bridging social capital networks, individuals' attachment to their physical, place-dependent, communities may increase or decline, respectively, as they are allowed greater access to bonding and bridging relations to individuals, groups, or communities otherwise geographically inaccessible to them. Hence, the application of Tuan's differentiation between space and place to an individual's use of the Internet to communicate and form attachments to others outside of the place-dependent community in which the individual resides allows that same individual to create meaning, or make a space meaningful, independent of if that space actually physically exists (i.e. the space in which interactions via the Internet occur) or if the individual has a limited knowledge of the place in which the individual, group, or community they are accessing is located. This conceptualization of how online social capital can become a mechanism for creating meaning despite geographic distance is particularly applicable to individuals, groups, and communities that are generally geographically isolated.

One of the consequences of the geographic isolation of communities is that the ways in which desirable social meaning is created begin to transform with the shifting demographics of the community as its separation from society as a whole begins to affect its internal demographic composition (Duncan 1999). Among others, two examples of such demographic shifts common to geographically isolated communities are shifts in the age structure of the community, generally to an older median age, and lower levels of total annual household income as businesses leave in search of broader accessibility to more people. In order to mitigate

geographic isolation, communities often attempt to connect themselves with major transportation lines such as inter-state highways, transcontinental railroads, or important waterways. But with the advent of space demolishing technologies such as the telephone and the Internet, the social aspects of community which are often confined by space, have a chance to ameliorate some of the consequences of geographical isolation through the place-independent actuation of social ties.

If online social capital exists as another form of social capital, than the theoretical question of if, and to what degree, can online social capital ameliorate some of the consequences of immobility and isolation felt by many residents of rural communities suggests that a place-independent form of social capital may have serious implications on the way community is experienced by individuals irrespective of geographic locality. For generations many rural poor have been trapped in poverty and have been stuck in place while the middle and upper classes of their communities enjoy a world apart from the reality that many of the rural poor face every day (Duncan 1999); online-bridging social capital may provide a way for this group to breach the physical boundaries that were previously too costly to cross. Residential immobility, whether for financial or personal reasons, is often an underlying factor of community attachment for rural residents (Erickson et al. 2012), suggesting that this sense of "stuckness" experienced by many residents of rural communities is a type of cognitive dissonance that may be mitigated via online social capital. Individuals who are unable to leave due to their poverty or other circumstances express attachment to the communities in which they reside simply because they know that there is no other place they can go (Duncan 1999). Normally bridging social capital is what assists individuals to break free of such circumstances, but in many rural communities the costs of mobility are often greater than those in their urban counterparts. Hence, as Internet access and

use increases, eventually those individuals who are constrained due to poverty or other circumstances may be capable of obtaining, to at least a small degree, the benefits of bridging social capital through the actuation of online-bridging social capital.

Building from this perspective, I posit that the introduction of online-bridging social capital into models of community attachment may ameliorate some of the feelings of physical immobility, or "stuckness" (Brown et al. 2000) experienced by residents of rural communities. In this way, online social capital may give individuals the ability to form attachments with people from otherwise geographically inaccessible locations. Admittedly, this argument of how online social capital may benefit individuals is more applicable to individuals with less physical mobility such as many of the poorer residents of rural communities (Duncan 1999; Erickson et al. 2012), but that does not mean that they are only group of individuals that can benefit from online-bridging social capital.

Online social capital can also provide access to relatives and close friends who move out of the shared physical community with a given individual, or who have always lived outside the individual's community, and thus effect individuals' attachment to the physical communities in which they reside. In so doing online social capital allows individuals to maintain relationships despite geographic separation. This association between online social capital and community attachment works through the specific mechanism of online-bonding social capital. Actuated in this way online-bonding social capital may ameliorate some of the psychological and social distress associated with the departure, or continued separation, of individuals or groups within an actor's bonding relations. Consequently, I posit that in models of community attachment, online-bonding social capital will be associated with an estimated positive relationship to individuals' perceptions of community attachment.

Similarly, an individual's perceptions of community satisfaction, or a feeling of their standing in society generally as enacted in a physical locality specifically, can be greatly affected by the actuation and/or creation of place-independent, online, social capital. Community satisfaction reflects an individual's belief that the place-dependent community in which she or he resides facilitates his or her successful participation in a larger mass-consumer society (Erickson et al. 2012), thus in a world where more and more of the relationships and access to goods and services that we want and need in order to successfully participate in a larger consumerist society require a place-independent means of connection and access. Thus, I posit that higher levels of online-bridging social capital will increase an individual's perception of community satisfaction and conversely that higher levels of online-bridging social capital will share an inverse relationship with how individuals perceive their physical, place-dependent, communities facilitate their successful participation in society at large.

SUMMARY OF HYPOTHESES

What follows is a summary list of the research questions proposed in this study and the respective hypotheses to be tested in the analyses of this study associated with each research question.

R1. To what degree can measures of social capital be bifurcated based upon the medium of actuation, whether online or offline in both boning and bridging forms of social capital?

H1: Online-bonding social capital and offline-bonding social capital are empirically distinct constructs.

H2: Online-bridging social capital and offline-bridging social capital are empirically distinct constructs.

H3: Online-bonding social capital and online-bridging social capital are empirically distinct constructs.

R2. How, and to what degree, do online-bonding, online-bridging, offline-bonding, and offline-bridging social capital explain variations in individuals' perceptions of community attachment to the physical communities in which they reside?

H4: The estimated association between online-bonding social capital and community attachment will be positive.

H5: The estimated association between online-bridging social capital and community attachment will be negative.

H6: The estimated association between offline-bonding social capital and community attachment will be positive.

H7: The estimated association between offline-bridging social capital and community attachment will be negative.

R3. How, and to what degree, do online-bonding, online-bridging, offline-bonding, and offline-bridging social capital explain variations in individuals' perceptions of community satisfaction with the physical communities in which they reside?

H8: The estimated association between online-bonding social capital and community satisfaction will be positive.

H9: The estimated association between online-bridging social capital and community satisfaction will be positive.

H10: The estimated association between offline-bonding social capital and community satisfaction will be positive.

H11: The estimated association between offline-bridging social capital and community satisfaction will be positive.

DATA

The data used in this study come from the 2010-2012 Montana Health Matters study, a state-representative survey of Montana, USA. The original sample was divided based on the U.S. Census Bureaus' definition of urban areas, and the Veterans Health Administration's (VHA) distinctions between rural, and highly rural areas. The U.S. Census defines an urban area as any densely developed territory with a population of at least 50,000. The VHA defines highly rural areas as areas in counties having a population density of less than 7 people per square mile, and rural areas as the remaining areas that are neither urban nor highly rural (West, Lee, Shambaugh-Miller, Bair, Mueller, Lilly, Kaboli, and Hawthorne 2010).

Following the division of the geographic areas into urban, rural, and highly rural areas, selection into the survey was conducted using a random two-stage ZIP code process. A random sample of households were chosen from each of the 62 selected ZIP codes, spanning 52 unique communities, using the United States Postal Service's computerized Delivery Sequence File (DSF), resulting in the identification of 5,000 total households consisting of 2,000 highly rural households, 2,000 rural households, and 1,000 urban households. The study used a multi-method, five-wave mail/telephone survey protocol and a small honorarium to maximize survey response (Dillman 2009).

In the initial 2010 wave there were 3,512 respondents, with 1,498 in rural, 1,523 in highly rural, and 493 in urban areas. The measures of online social capital were included in the one-year follow-up survey that had an 85 percent response rate (n = 2,614). The resulting division in to rural, highly-rural, and urban areas of the 2012 follow-up wave indicates that there are 1,392

respondents from rural communities, representing approximately 40 percent of the total sample, 1,629 respondents from highly rural communities, representing approximately 46 percent of the total sample, and 493 respondents from urban areas, representing approximately 14 percent of the total sample.

Investigating Differences Between the Full Sample and the Reduced Sample

For this study a reduction in the sample was made to exclude individuals without in-home Internet access. The reason for this exclusion is simply that a study exploring the existence of online social capital and comparing it to offline social capital necessitates a sample of individuals with daily access to the Internet. It should be noted that this restriction does not affect the number of communities in the data, as all of the communities in the survey have Internet access. Individuals included in the sample have a variety of in-home Internet access types, including dial-up, satellite, cellular, DSL, and cable which are all treated equally in later stages of the analysis. After excluding individuals without in-home Internet access the resulting adjusted sample size is 1980, which represents a reduction of approximately 43 percent from the full sample. Within this reduced sample there are 274 respondents from urban communities, representing approximately 14 percent of the reduced sample; 810 from rural communities, representing approximately 41 percent of the reduced sample, and 896 from highly rural communities, representing approximately 45 percent of the reduced sample. And while the reduction in sample size from the full sample is large (approximately 43 percent), the percentage of respondents across community types is nearly identical. And, before any analyses are run, comparisons of differences over other important demographic characteristics between individuals with and without in-home Internet access over the three categories of community type are considered. A summary of those comparisons are discussed more thoroughly below.

Investigating employment status by Internet access over community type (see Figure 1) reveals that in urban communities the median individual who does not have access to the Internet at home is unemployed and not looking for work, while the median individual in rural and highly rural communities who does not have in-home Internet access is retired and not working. On the other hand, the median individual with in-home Internet access is employed across all community types. Yet, considering the span of a single standard deviation in either direction of the median shows that with the exception of urban communities the full range of employment status (full-time, part-time, unemployed looking for work, unemployed not looking for work, and retired and not working) is covered by both categories of people, those with and those without in-home Internet access.

(Figure 1 about here)

While the range of employment status appears similar when compared across having in-home Internet access or not and community type, the distribution of household income by Internet access over community type does not appear to share the same consistency (see Figure 2). Not surprisingly individuals without in-home Internet access generally have a lower total household income compared to individuals with in-home Internet access. Furthermore, this finding holds for all community types. Yet, considering the one standard deviation region surrounding the median of total household income suggests that while the median household income differs between respondents with in-home Internet access and those without, there is, independent of community type, always a region of overlap between the two groups, indicating that even total household income is not a perfect corollary of whether individuals have in-home internet access.

(Figure 2 about here)

Another interesting fact about the data is that, independent of community type, the median percentage of an individual's life spent in the community where they resided at the time of the survey is higher for individuals without in-home Internet access than for those with in-home Internet access. This finding may simply reflect the fact that in-home internet access is highly associated with total household income, and total household income is closely linked to an individual's highest level of education. Unfortunately, there is not a measure of individual educational attainment to explicitly investigate this claim, but it is reasonable to assume that the lower percentage of life spent in a community by individuals with in-home Internet access is likely highly correlated with time spent outside of the community pursuing higher education, which is in turn reflected in the differences in total household income. Another possibility is that the higher proportion of life spent in the community by individuals without in-home Internet access is evidence that those individuals don't like change both in where they live and in the mediums they use for communication.

Some of the variation between income levels, employment status, and the percentage of life spent in a community by in-home internet access may also be generational. As shown in Figure 3, independent of community type, the median age for individuals with in-home Internet access is lower than that for individuals without such access. The differences are greater in rural and highly rural communities, but only slightly so. While the median age of both groups is lower in urban areas than in either rural or highly rural communities suggesting that the seemingly lower age of both individuals with and without in-home Internet access in urban communities is just an artifact of higher average ages in both rural and highly rural communities In short independent of which sample is considered individuals in rural communities are, on average, older.

(Figure 3 about here)

With regards to the variables used to create the latent variables of offline-bonding and offline bridging social capital, community satisfaction, and community attachment, there appears to be little, if any, difference in the median responses between individuals with in-home Internet access and those without in-home Internet access. A full presentation of the box plots for each of these variables can be found in Appendix 1

In summary, the in-home Internet access only sample, as compared to the full sample, has a few differences. Namely, individuals in the former appear to have higher levels of total household income, better employment stability, and less physical immobility than their peers in the latter group. The interpretation of the results of the analyses undertaken in this study, thus, should include an understanding of these differences. But, the differences do not appear to be significant enough to cause any alarm in the reduction of the sample to exclude individuals without in-home Internet access.

MEASURES

The measures used in this study stem from previous research and the theoretical foundations of social capital and in their final forms represent a combination of observed and latent variables. Although a little un-orthodox, the identification of the key explanatory variables is presented before a discussion of the outcomes variables due to the need for an extra step of exploratory factor analysis (EFA) in identifying the measures of online and offline social capital. Within this study measures of online-bonding and online-bridging social capital expand the measures and concepts first used by Stern and Adams (2010) while measures of offline-bonding and offline-bridging social capital are based upon the conceptualizations used by Agnitsch, Flora, and Ryan (2006) and Besser (2009). Conversely, the outcome variables are reproduced

exactly as described in previous literature (see for example Brown 1993, Brown et al. 2000; Theodori 2001; 2004), hence the step of EFA is skipped in the process of identifying the measures of community attachment and community satisfaction, and the validity of these measures are tested during confirmatory factor analysis alongside the key independent variables as identified in the EFA stage of analysis. Following the presentation of the measurement of the key explanatory variables and the outcome variables a discussion of the control variables used in the analyses is presented.

Exploratory Factor Analysis

Following the theoretical development of offline-bonding and -bridging social capital used by Besser (2009) and Agnitsch et al. (2006) and expanding upon the constructions of online-bonding and -bridging social capital by Stern and Adams' (2010), I identified the observed variables within the data which best represent the best theoretically appropriate measures for the creation of the latent constructs of online-bonding, online-bridging, offline-bonding, and offline-bridging social capital. Due to the implicit difficulty in capturing norms, values, and feelings of reciprocity via Internet communications, the observed measures of online social capital are representative of a quantitative conceptualization of social capital. But, so as not to lose the other side of social capital, offline social capital is structured around the qualitative aspects of social capital, centered on individuals' feelings of trust, friendship, and reciprocity in their physical, place-dependent, communities. While capturing both the quantitative and qualitative aspects of social capital, these measures expand upon the formation of social capital as used by Stern and Adams (2010) for online social capital and Besser (2009) and Agnitsch, Flora, and Ryan (2006) for offline social capital. Table 1 lists the descriptions and summary statistics for the observed variables used in the creation of the four latent explanatory

variables. The variable names are included in Table 1to facilitate the display and legibility of the constructs depicted in Figure 4, Figure 5, and Figure 6.

(Table 1 about here)

Using Mplus, I conduct an exploratory factor analysis (EFA) of online-bonding and -bridging social capital and offline-bonding and -bridging social capital separately. Both analyses use Mplus's exploratory factor analysis command, specifying the estimator type as weighted least squares with mean and variance adjustment (WLSMV) in consideration of the categorical nature of the observed variables (Bandalos 2006).

Results from the exploratory factor analysis of online-bonding and online-bridging social capital (see Figure 4) identify the best representation of the data as a model of two latent variables with factor loadings following the general theoretical distinctions between bonding and bridging social capital. Figure 4 depicts the formation of both online-bonding and online-bridging social capital and lists the factor loadings for each observed variable. All factor loadings are significant at the $p < 0.05$ level, the default reporting level for Mplus's EFA command.

(Figure 4 about here)

The EFA of offline-bonding and offline-bridging social capital (see Figure 5) identifies the best fitting representation of the data as composed of three latent variables with factor loadings following the theoretical definitions of bonding and bridging social capital put forth by Besser (2009) and Agnitsch, Flora, and Ryan (2006). Of the three latent variables identified the theoretical distinctions of the variables are such that two of the latent variables are indicative of bonding social capital while the third clearly represents bridging social capital.

(Figure 5 about here)

The results of the two exploratory factor analyses suggests that the manifest variables used in this study are adequate representations of bonding and bridging social capital in both online and offline forms, but in order to verify that claim, further model identification is undertaken using confirmatory factor analysis. An EFA of offline social capital amongst individuals without in-home Internet access was also conducted (see Appendix 2), with the results suggesting that little variation in the conceptual construction of offline social capital between individual with, and those without in-home Internet access.

Confirmatory Factor Analysis

The process of confirmatory factor analysis (CFA) is also conducted using Mplus and proceeds with a single model structured around the five latent variables identified in the process of exploratory factor analysis outlined above, and the two latent outcome variables of community attachment and community satisfaction as constructed according to the previous literature (see for example Brown 1993, Brown et al. 2000; Flaherty and Brown 2010). In order to maintain the necessary symmetry required to test configural differences between online and offline social capital in bonding and bridging forms, a second-order factor using the two latent variables theoretically tied to offline-bonding social capital identified in the EFA stage of analysis (see Figure 5) is created. The creation of this second order factor not only facilitates interpretation in the final models, but also allows for a clear comparison of bonding and bridging social capital across online and offline mediums of actuation. Figure 6 depicts the CFA of the four explanatory latent variables as well as the latent outcome variables of community attachment and community satisfaction as they are used in the structural equation models of community attachment and community satisfaction.

(Figure 6 about here)

Included in the CFA are the two latent outcome variables of community attachment and community satisfaction which are constructed as described below. Community attachment is constructed using two observed variables: *fit* and *common* (Brown et al. 2000). The observed variable *fit* asks respondents to rate, on a scale of one to seven, where one means poorly and seven means well, how well they feel they fit into their community. The observed variable *common* similarly asks respondents to rate, on a scale of one to seven, where one means nothing and seven means everything, how much they feel they have in common with most of the people in their community (Brown et al. 2000). The measurement of community satisfaction follows the construction of the same in Brown et al. (2000) using two observed variables: *satisfaction* and *ideal*. The observed variable *satisfaction* asks respondents to rate, on a scale form one to seven, where one means dissatisfied and seven means satisfied, how satisfied they are with living in their community. Similarly, the observed variable *ideal* asks respondents to imagine the ideal community in which they would like to live and then rank, on a scale of one to seven, their present community compared to their ideal community, where one indicates that their present community is "farthest from" their ideal community and seven indicates that their present community is "closest to" their ideal community. As explained in the Data section, these four observed variables have very little variance between individuals with and those without in-home Internet access and across the three community types of urban, rural, and highly rural (see Appendix 3).

In all cases the factor loadings for each of the observed variables for the six latent variables modeled in the CFA stage of analysis (see Figure 6) are significant at the $p < 0.001$ level, all standardized factor loadings are greater than 0.54, and the residual errors of all loading variables are held independent of one another throughout the analyses. The model fit for the

configural model depicted in Figure 6, confirms that the division of social capital into online and offline forms of bonding and bridging social capital and the construction of community attachment and community satisfaction are a good representation of the data as a whole with a root mean squared error of 0.056, a CFI of 0.966, and a TLI of 0.96. Furthermore, the distinctions between the concepts follows the traditional separation of community measures and social capital (Besser 2009, Agnitsch et al. 2006, Brown et al. 2000)

Additionally, I tested the CFA for offline social capital, community satisfaction, and community attachment for individuals without in-home Internet access (see Appendix 4). While a rigorous invariance test was not performed the results suggest that there is little variation in the construction of offline-bonding social capital, offline-bridging social capital, community attachment, and community satisfaction between individual with and those without in-home Internet access.

Control Variables

The observed variables used as controls in this study follow generally the literature on community attachment and community satisfaction (see for example Erickson et al. 2012; Flaherty and Brown 2010) and are: the total income in a respondents' household, respondents' sex, respondents' ages, the quadratic of respondents' ages respondents' marital statuses, the proportion of respondents' lives spent in the community in which they resided at the time of the survey, respondents' community type (urban, rural, highly rural), and the population size of the communities in which respondents' reside. Unfortunately, the data lack a composite SES variable such as been used in other studies (Flaherty and Brown 2010). Table 2 presents the basic summary statistics of the above mentioned control variables. While the following provides an in-depth description of each of the above mentioned covariates.

(Table 2 about here)

The income measure used in this study is representative of respondents' total annual household income and is measured as a categorical variable with 15 categories with a range such that a value of one indicates a total annual household income less than $10,000 and a value of fifteen indicates a total annual household income equal to, or greater than, $150,000 As shown in Figure 7, the distribution of respondents' total annual household using these 15 categories is nearly follows a normal distribution, with a late increase in the proportion of individuals with a total annual household income between $100,000 and $149,999 (approximately 11 percent of the sample).

(Figure 7 about here)

The employment status of respondents is measured using a bivariate measure with one indicating part- or full-time employment or self-employment. Within the 1,980 individuals with in-home Internet access, approximately 60 percent are employed or self-employed in part- or full-time jobs.

Within the sample, respondents' ages range from 21 to 98 with an average age of approximately 58 and a median age of 59, representing a nearly perfect normal distribution (see Figure 8). Age squared is used to capture any no linear correlations between respondents' ages and the outcome variables. In order to capture a balanced and proportional measure of the impact of time spent in the community I created a measure which represents the proportion of respondents' lives spent living in the communities in which they resided that the time of the survey. This measure is created by dividing a respondent's age by the total number of years spent living in the community irrespective of consecutivity (Erickson et al. 2012; Flaherty and Brown 2010). On average, respondents have spent 48 percent of their lives residing in the communities

in which they were found at the time of the survey. Respondents' marital status is also taken into account through a bivariate measure indicating if respondents were married at the time of the survey. Within the sample, approximately 79 percent of respondents are married. Sex is also considered, and within the sample, approximately 57 percent of respondents are female.

(Figure 8 about here)

Respondents' community types are divided into two bivariate measures indicative of residence in a rural community and residence in a highly rural community, thus leaving urban communities as the reference group during analysis. Within the sample, approximately 41 percent of respondents live in rural communities and approximately 45 percent live in highly rural communities, leaving the 14 percent of the sample who reside in urban areas as the reference category. Finally, the population size of respondents' communities is measured as a five item categorical variable such that: a value of one indicates residence in a community of less than 1,000 people, a value of two indicates residence in a community with a total population between 1,000 and 3,999 people, a value of three indicates residence in a community with a total population between 4,000 and 6,999 people, a value of 4 indicates residence in a community with a total population between 7,000 and 29,999 residence, and a value of five indicates residence in a community with a total population greater than 30,000 people. Within the sample the median individual lives in a community with a population size between 4,000 and 6,999. The percentage of the sample that lives in each category is fairly well balanced with nearly one fifth of the sample in each category (1 = 24%, 2 = 20%, 3 = 15%, 4 = 21%, 5 = 20%).

FULL STRUCTURAL EQUATION MODELS

The final stages of analysis in this study revolve around a series of five iterations of two separate structural equation models (SEMs) with community attachment and community

satisfaction as the respective outcome variables. The model specification for the community attachment and community satisfaction SEMs are identical throughout the five SEMs estimated. Each successive iteration of the SEMs includes more covariates until the full model is specified in model five. And, although model five is the only model to include community, or second level, measures, a multilevel model structure is used throughout the estimation of all five models.

The multilevel aspect of the analysis allows the models to account for community specific residual error, instead of assuming that all residual error variance occurs within individuals, and also identifies a community specific intercept based on the individual level covariates used in the respective models. By including a community-level residual error estimate in conjunction with an individual-level residual error estimate, a significant portion of the community level variation in the outcomes and explanatory variables is accounted for. Finally, the four latent explanatory variables of online-bonding, online-bridging, offline-bonding, and offline-bridging social capital and the two latent outcome variables of community attachment and community satisfaction are constructed as outlined in the CFA stage of analysis (see Figure 6).

Formulas (1) and (2) illustrate the symmetry of the SEMs used in this study, with Y_{1ij} equal to community attachment for individual *i* in community *j* and Y_{2ij} equal to community satisfaction for individual *i* in community *j*. The explanatory variables X_{nij} represent individual-level responses with: X_{1ij} equal to online-bonding social capital, X_{2ij}equal to online-bridging social capital, X_{3ij} equal to offline-bonding social capital, X_{4ij} equal to offline-bridging social capital, X_{5ij} equal to age, X_{6ij} equal to age squared, X_{7ij} equal to the percentage of a respondent's life spent in community *j*, X_{8ij} equal to the total household income of individual *i* in community *j*, X_{9ij} equal to one if respondent *i* in community *j* is employed or self-employed full- or part-time

in an income generating occupation and zero otherwise, X_{10ij} equal to one if respondent *i* in community *j* self identifies as female and zero otherwise, and X_{11ij} equal to one if respondent *i* in community *j* is married and zero otherwise. The explanatory variables Z_{kij} represent community level responses such that: Z_{1j} is equal to one if community *j* is by definition rural (has a total population less than 2,500 and an average population density greater than seven people per square mile) and zero otherwise, Z_{2j} is equal to one if community *j* is by definition highly rural (has a total population less than 2,500 and an average population density less than seven people per square mile) and zero otherwise, and Z_{3j} is equal to the respective categorical response indicating the total population size of community *j*. Lastly, u_{0j} represents the community, or level two, residual error, while ε_{ij}represents the individual, or level one, residual error.

$$(1) \quad Y_{1ij} = \alpha_{00} + \beta_{1ij}X_{1ij} + \beta_{2ij}X_{2ij} + \beta_{3ij}X_{3ij} + \beta_{4ij}X_{4ij} + \beta_{5ij}X_{5ij} + \beta_{6ij}X_{6ij} + \beta_{7ij}X_{7ij} + \beta_{8ij}X_{8ij} + \beta_{9ij}X_{9ij} + \beta_{10ij}X_{10ij} + \beta_{11ij}X_{11ij} + \alpha_{1j}Z_{1j} + \alpha_{2j}Z_{2j} + \alpha_{3j}Z_{3j} + u_{0j} + \varepsilon_{ij}$$

$$(2) \quad Y_{2ij} = \alpha_{00} + \beta_{1ij}X_{1ij} + \beta_{2ij}X_{2ij} + \beta_{3ij}X_{3ij} + \beta_{4ij}X_{4ij} + \beta_{5ij}X_{5ij} + \beta_{6ij}X_{6ij} + \beta_{7ij}X_{7ij} + \beta_{8ij}X_{8ij} + \beta_{9ij}X_{9ij} + \beta_{10ij}X_{10ij} + \beta_{11ij}X_{11ij} + \alpha_{1j}Z_{1j} + \alpha_{2j}Z_{2j} + \alpha_{3j}Z_{3j} + u_{0j} + \varepsilon_{ij}$$

RESULTS

Before undertaking a discussion of the full model results, it is paramount that we establish if and to what degree online social capital differs from offline social capital. While the process under which that distinction is investigated begins with the formation of the concepts in the exploratory and confirmatory factor analyses, a true test of their relative uniqueness when compared to one another is not employed until the full analysis thus allowing for the effects of all the other covariates to be controlled for. The test used to determine the relative uniqueness of

online-bonding, online-bridging, offline-bonding, and offline-bridging social capital with regards to one another is a test of their discriminant validity.

To test the discriminant validity between the latent constructs of online and offline social capital, in bonding and bridging forms, a two tailed t-test of the difference between one and the estimated correlations between the respective latent variable and all others is constructed. These tests of discriminant validity provide empirical tests of hypotheses 1, 2, and 3 (see pages 18-19). The results of the tests of discriminant validity, along with their respective standard errors and p-values are reported in Table 3.

(Table 3 about here)

The results of the tests of discriminant validity suggest that, at a statistical level, each of the concepts (online-bonging social capital, online-birding social capital, offline-bonding social capital, and offline bridging social capital) represent distinct constructs as indicated by the statistically significant difference between one and the correlation value for each pair shown in Table 3. The level of the respective uniqueness between a given construct and the others is represented by the absolute value of one minus the correlation between each pair. A value closer to one indicates more uniqueness, or put differently a value closer to one suggests that the two constructs share less covariance, indicating a greater level of statistical distinction.

Testing the discriminant validity of the concepts of online-bonding, online-bridging, offline-bonding, and offline-bridging social capital is a necessary step in empirically testing if social capital actuated online is in fact a separate and distinct measure of social capital apart from offline social capital. The results presented in Table 3 suggest a positive response to hypotheses 1, 2 and 3 (see pages 18-19) confirming that: 1) online-bonding social capital is a distinct measure of social capital separate from offline-bonding social capital, 2) online-bridging social

capital is a distinct measure of social capital separate from offline-bridging social capital, and 3) while sharing a small degree of positive correlation, online-bonding social capital is a distinct measure of social capital separate from online-bridging social capital.

With the confirmation of hypotheses 1 – 3, an analysis of the structural effects of online-bonding, online-bridging, offline-bonding, and offline-bridging social capital as separate and distinct explanatory variables in models of community attachment and community satisfaction can be undertaken with greater statistical certainty that the measures actually represent distinct forms of social capital.

The results for the full SEMs are presented in two tables with Table 4depicting the empirical results for the community attachment SEMs, and Table 5 the empirical findings for the community satisfaction SEMs, within each model all reported coefficients are unstandardized. Additionally, the SEMs for both outcomes are estimated simultaneously, hence the fit statistics reported below each model are indicative of how both models simultaneously fit the data given the specified covariates. The simultaneous estimation of the SEMs allows the fit statistics to indicate how both models, together, fit the data instead of calculating individual fit statistics, resulting in the model fit being more representative of individuals' perceptions of community as a whole instead of either aspect of an individuals' perception of community attachment and community satisfaction separately. The rest of this section gives a brief description of the statistically significant results for both the community attachment and community satisfaction SEM as well as a summary of the implication those results have for hypotheses 4 – 11 (see pages 19-20).A discussion of substantive significance will be undertaken in the discussion and conclusion sections.

(Table 4 about here)

Within the community attachment SEMs (see Table 4) there are a number of statistically significant results, including: online-bonding social capital, offline-bridging social capital, offline-bonding social capital, age, the proportion of life spent in the community, and total annual household income. While there is some variation in the size and significance of the effects of the various covariates over the five models, in general, the results are fairly consistent.

While controlling for the other covariates in the respective SEMs, online-bonding social capital yields a statistically significant effect on community attachment in both model two and model five. The estimations suggests that online-bonding social capital is associated with an expected increase in an individual's attachment to the physical community in which she/he resides. Similarly, although to a much larger degree, increases in offline-bonding social capital are associated with increases in community attachment. Increases in offline-bridging social capital, on the other hand, are associated with an estimated decrease in community attachment. Age and the quadratic formation of age are both statistically significant in the models, and while controlling for the other covariates in the models, are associated with an estimated positive impact on an individual's attachment to the community in which they reside. But, while the estimated association between the quadratic formation of age and community attachment is statistically significantly different from zero, only the linear formation of age appears to have a substantive impact on an individual's attachment to the physical community in which she/he resides. In addition to an individual's age, the proportion of their life spent in the community, while controlling for the other covariates in each SEM respectively, has a strong positive impact on community attachment. In fact a change in the proportion of an individual's life spent in the community has the largest effect, of the variables considered, on an individual's perception of community attachment. This finding coincides with other studies using the percentage of life

individuals spend in their physical communities (Flaherty and Brown 2010). Finally, while controlling for the other covariates in the model, increases in total annual household income are associated with a increases in community attachment. The results presented in Table 4 suggest a confirmation of hypotheses 4 - 7 (see page 19), but only hypotheses 4, 6, and 7 are associated estimates that are statistically significant at least at the $p < 0.05$ level.

Within the results of the community satisfaction SEMs (see Table 5), online measures of bonding and bridging social capital do not provide statistically significant estimates, but there are a number of statistically significant results, including: offline-bonding social capital, offline-bridging social capital, age, the proportion of life spent in the community, and total annual household income. While controlling for the other covariates in the respective SEMs, increases in offline-bonding social capital are associated with increases in community satisfaction. Increases in offline-bridging social capital, on the other hand, are associated with an estimated decrease in community satisfaction. Age and the quadratic formation of age are both statistically significant in the SEMs, and while controlling for the other covariates in the SEMs, are associated with an estimated positive impact on an individual's perception of community satisfaction. Although, just as was found in the community attachment SEMs, while the effect of the quadratic formulation of age is statistically different from zero, the majority of the estimated impact associated with age has a linear relationship to community satisfaction. Closely connected to age, the proportion of an individual's life spent in the community in which they currently reside has a strong estimated effect on their perceived community satisfaction. Also, just as was the case with the community attachment SEMs, the proportion of an individual's life spent in the community has the largest impact on community satisfaction. Lastly, total annual

household income, while controlling for the other covariates in the respective SEMs, is associated with an estimated positive effect on community satisfaction.

(Table 5 about here)

The results presented above, and in Table 5, suggest a positive response to hypotheses 8 and 10 and a rejection of hypotheses 9 and 11 (see page 20), but it should be noted that only hypotheses 10 and 11 are associated statistically significant estimates.

DISCUSSION

Building upon a growing literature, this study adds to the theoretical conceptualization of how increased Internet access and use in the daily lives of individuals are affecting the way they interact with and view the social world they live in and provides empirical evidence in support for the inclusion of measures of online social capital in models of community attachment and community satisfaction. In the process of identifying those associations I explored two general research questions: 1) that online-bonding and online-bridging social capital exist as separate and distinct constructs apart from offline-bonding and offline-bridging social capital, and 2) that, while controlling for the effects of offline social capital, social capital actuated online has a significant impact on individuals' attachment to and satisfaction with the communities in which they reside.

In the first regard this study was successful. The empirical evidence indicates that online-bonding and online-bridging social capital are not only theoretically distinct from offline social capital, but that the distinction is statistically verifiable. This result adds further evidence in support of Stern and Adams (2010) distinctions of online-bonding and online-bridging social capital while also supporting Quan-Hasse and Wellman's (2004), Penard and Pousing's (2010), and Huysman and Wolf's (2004) suggestions that the incorporation of the Internet into everyday

life requires the development of new measures of social capital. With the increased use of the Internet in the everyday lives of individuals, the inclusion of online-bonding and -bridging social capital in studies utilizing social capital theory may assist in understanding of the effects of social capital generally.

Beyond a simple distinction between online and offline social capital, the discriminant validity tests between online-bonding, online-bridging, offline-bonding, and offline-bridging social capital provide empirical evidence suggesting that a complementary relationship between online and offline forms social capital exists. Connecting the empirical results to theory, the small correlations between online-bonding and -bridging and offline-bonding and -bridging social capital indicated by numbers close to one in Table 3 corroborates Gilleard et al. (2007) hypothesis that increases in online social capital do not act as corrosive forces against offline social capital. Furthermore, the directionality of the effects of online and offline social capital in the models of community attachment and community satisfaction (see Table 4 and Table 5) suggests that the concepts are at least supportive of one another in their association with individuals' perceptions and attachment to the communities in which they reside. And while further examination of the data is required to make a definitive statement in this regard, these findings appear to suggest that online and offline social capital operate best as complements, or at least as supplements, instead of rivals. These findings adds strength to Fischer's (2005) claim that social capital is not in decline, and that what Putnam (2000) identifies as a possible decline in social capital may in fact stem from a static conceptualization of social capital as opposed to a genuine decline in social capital generally.

The bifurcation of social capital between online and offline forms outlined in this study may lead some to attempt justifications for further divisions of social capital based on places of

actuation, such as social capital accessed at/through an individual's place of employment, recreational sport teams, clans or alliances in video games, and other such groups. This idea is receiving more attention in the social capital literature, in particular amongst family and education scholars (see for example Dufur, Parcel, and Troutman 2013). But, while divisions of social capital predicated upon specific contexts may be useful for understanding how social capital created in different environments differ in their effects on social outcomes, in most cases such divisions represent more restrictive definitions of bonding and bridging forms of social capital (Parcel et al. 2010). The actuation of social capital through different mediums, however, is a larger conceptual distinction of social capital that encapsulates bonding and bridging social capital as sub-categories, rather than representing further refinements of bonding and bridging social capital built in specific contexts. Thus, the argument can be made that the actuation of social capital online, or through a place-independent medium, represents a new form of social capital distinct from offline social capital, whereas the distinction of social capital created in specific contexts typically represents further refinements of the same type of social capital.

The name "online" social capital may be a misnomer since other technologies exist that can facilitate a place-independent actuation of social capital (e.g. the telephone and in particular cellular/satellite phones), but such technologies pale in comparison to the breadth, flexibility, and continuing innovation of social expression capable through use of the Internet. One particularly poignant example of the innovative ways in which the Internet can be used to access social capital independent of place came during, and immediately following, the 2012 attack on the U.S. consulate in Benghazi, Libya. Sean Smith, a husband, father, US Air Force veteran, and then Foreign Service Information Management Officer at the U.S. consulate, was communicating with members of his guild in Eve online, a massively multi-player online game which takes place

in a simulated galaxy centered on player developed industries, governments, trade, and foreign relations, when attackers broke into his office in the consulate and killed him. After Sean's death, members of his online social capital networks organized a fundraiser to help support his wife and children (Wired 2012). Another member of the Sean's online social capital networks expressed that she "never expected to feel this gutted over the death of someone that [she] never met in real life" (Wired 2012). While not everyone expresses online social capital through participation in massively multi-player online games, the example of Sean Smith illustrates that the incorporation of the Internet into the everyday lives of individuals can create new forms of social capital that are not bound to physical place, but which can have a significant impact on individuals lives as experienced in a physical place.

With respect to the second research question, that online social capital would have a separate and significant impact apart from offline social capital, on individuals' perceptions of the physical communities in which they reside, the results provide mixed findings. When modeling community attachment, online-bonding social capital has a significant impact in the same direction, but to a much smaller degree, as offline-bonding social capital, while in all other models the effects of both online-bonding and online-bridging social capital remain statistically and substantively insignificant. These results may indicate that with regards to the impact of social capital on perceptions of place-dependent communities, there is nothing quite as important as being physically present, or, the results may simply be indicative of specific characteristics of individuals living in Montana. But, the statistical and substantive differences between online and offline social capital may also be due to differences in how each form of social capital is measured.

Due to limitations in the data, the observed variables used to construct online and offline social capital represent quantitative and qualitative aspects of social capital respectively. The quantitative measures of online social capital indicate an enumeration of social networks by measuring the frequency of contact that individuals have, while the qualitative measures of offline social capital indicate a general sense of trust and friendship within a the community. Eliasson et al. (2013) find that qualitative aspects of social capital may be associated with larger impacts in models using both quantitative and qualitative measurements of social capital. Put differently, the norms and values of a network may be more important than the number of network members, or frequency of interaction (Eliasson et al. 2013). Thus, while the hypotheses concerning the distinction between online and offline social capital are supported generally (see p. 19-20), the observed substantive and statistical differences in the estimated effects of online and offline social capital on individuals' perceptions of community attachment and community satisfaction may be due to measurement error instead of differences between the medium of actuation. In this regard future research should seek out more equitable measures of online and offline social capital.

Beyond differences in the impact of online and offline social capital on community attachment and community satisfaction, this study found that online social capital operates independent of community type (urban, rural, and highly rural) and size, suggesting that the place-independent nature of online social capital functions as much for residents of urban communities as it does for residents of rural communities. This finding suggests that geographic isolation, at least in the case of Montana, may not be perceived by residents of rural communities as a pejorative aspect of physical place. For residents of rural and highly rural communities in Montana the distance, or geographic isolation, of their communities may be exactly what they

want. This, does not negate the distance demolishing properties of the Internet (Scott 2009), but is indicative of how residents of rural and highly rural communities in Montana view geographic isolation. Despite representing many rural communities, the rural and highly rural communities of Montana are not representative of all rural communities. Consequently, future research should seek to find, or collect, nationally representative data. But, for now, it can be said that within the state of Montana, online social capital impacts perceptions of community attachment and community satisfaction equally for residents of rural and urban communities.

The negative estimated association between bridging social capital in both online and offline forms and community satisfaction goes against the conceptualization of community satisfaction as representative of an individual's perception of how well their physical community allows them to successfully participate in a larger mass consumer society (Brown 1993; Erickson et al. 2012). While an analysis of the exact causes behind this contradictory finding are beyond the scope of this study, the finding does suggest that the conceptual definition of community satisfaction may be ill-represented by its measurement. While I like the idea of community satisfaction representing a broader sense of how a community helps individuals successfully incorporate into a larger mass consumer society, such as is currently prevalent in the USA, the results suggest that the actual measures of community satisfaction used in this study may not accurately capture that conceptualization of community satisfaction. Evidence for this possibility is particularly apparent in the negative estimated association between offline-bridging social capital and community satisfaction. Conversely, given the relative isolation of many of the communities represented in the Montana Health Matters 2010-2012 study, the negative association between bridging social capital and community satisfaction may simply be an artifact of internal characteristics and preferences on the part of residents of rural and highly rural

communities in Montana (i.e. individuals may prefer to live in geographically isolated communities as a way of escaping their incorporation into a larger mass consumer society).

CONCLUSIONS

Increases in the use of the Internet in the everyday lives of individuals is leading to the creation of place-independent forms of social capital which appear to affect individuals' perceptions of the communities in which they physically reside. The empirical evidence substantiates the theoretical division of social capital based upon the medium of actuation, online vs. offline, put forward by Quan-Haase and Wellman (2004) and suggests that the differentiation of social capital between place-dependent and place-independent mediums of actuation represents an aspect of social capital theory that requires further investigation.

In regards to questions concerning how place-independent forms of social capital affect individuals' perceptions of the geographically fixed communities in which they reside, the evidence suggests that, in the case of individuals and communities within Montana, that while controlling for the effect of offline, or place-dependent, social capital there is a moderate to weak effect of online, or place-independent, social capital on individuals' perceptions of community attachment and community satisfaction. However, the estimated effects of offline social capital consistently report a more substantive association with individuals' perceptions of community attachment and community satisfaction. This suggests that despite the substantive and statistical significance of online social capital in forming individual perceptions of community attachment and community satisfaction, individuals in Montana appear to place more importance on face-to-face actuations of social capital than other forms of actuation.

LIMITATIONS

As with all studies, the data, analyses, and the interpretation of the results of this study are subject to certain limitations. Many of these limitations are mentioned throughout the manuscript, but what follows is a concise list of the potential pitfalls present in this study and what future research should consider.

L1: The data used for the analyses in this study are limited to 52 communities within the state of Montana. Consequently, a generalization of the results beyond the state of Montana is inappropriate, and any suggestion of results beyond Montana are purely speculative.

L2: The survey questions used to construct online and offline social capital differ in their measurement of social capital. Offline social capital is constructed with what are typically considered qualitative measurements of social capital, while online social capital is created using a quantitative measures of social capital (Eliasson et al. 2013). The application of the respective measures of online and offline social capital used in this study are done so in an attempt to further test measures already present in the current literature base. The quantitative measures for online social capital are expanded from Stern and Adams (2010) study of two communities in eastern Washington and Idaho while the qualitative measures of offline social capital are exact replications of items used by Besser (2009) and Agnitsch et al. (2006) in their studies of social capital among rural communities in Iowa. Future research should seek to use common measures of social capital, whether qualitative or quantitative, for both online and offline social capital. A common measurement of social capital across both online and offline forms of actuation may provide clearer understanding of the empirical distinctions between online and offline social capital both in their measurement and in their impact on individuals' perceptions of community.

L3: The measures of online-bridging social capital used in the previous literature (Stern and Adams 2010) and this study are more representative of an exchange of goods and services resulting in financial gains than measures of norms common to bridging social relations. Bridging social capital is not a measure of how well an individual can seek out and find economic opportunities; rather, bridging social capital represents an individual's association with diverse groups, individuals, and communities whose norms differ from the typical norms in their bonding relations. Such relationships are connections with various civic groups, non-governmental organizations, individuals from different cultural backgrounds or religions, etc. Consequently, future research should consider new measures of online-bridging social capital that more appropriately capture individuals' access to use of bridging social relations such as asking individuals about their use of the Internet to interact with groups, individuals, and/or communities whose norms differ from their typical bonding social relations.

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Figure 1: The Distribution of employment Status by Internet Access and Community Type

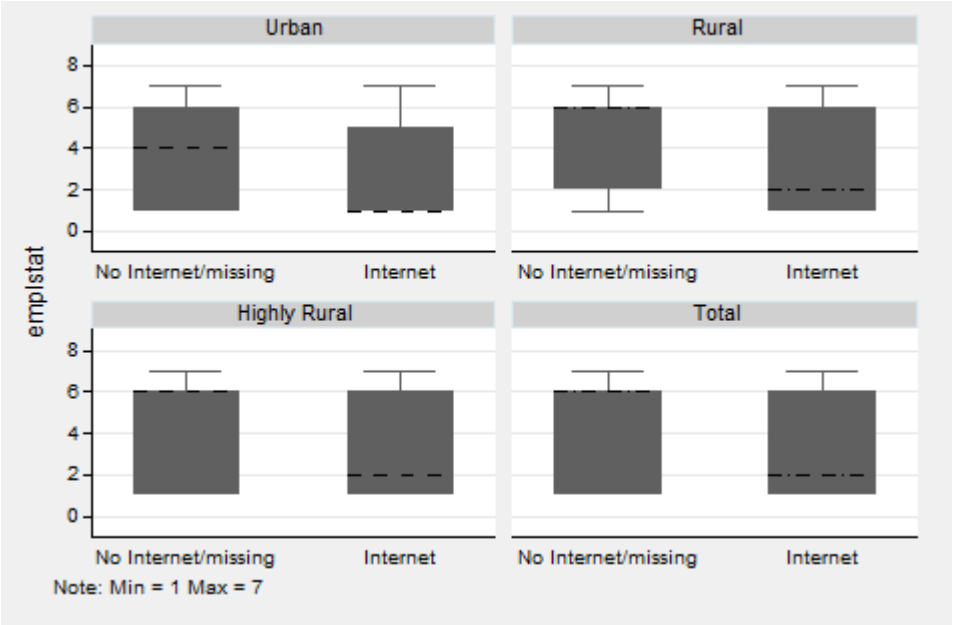


Figure 2: The Distribution of Total Annual Household Income by Internet Access and Community Type

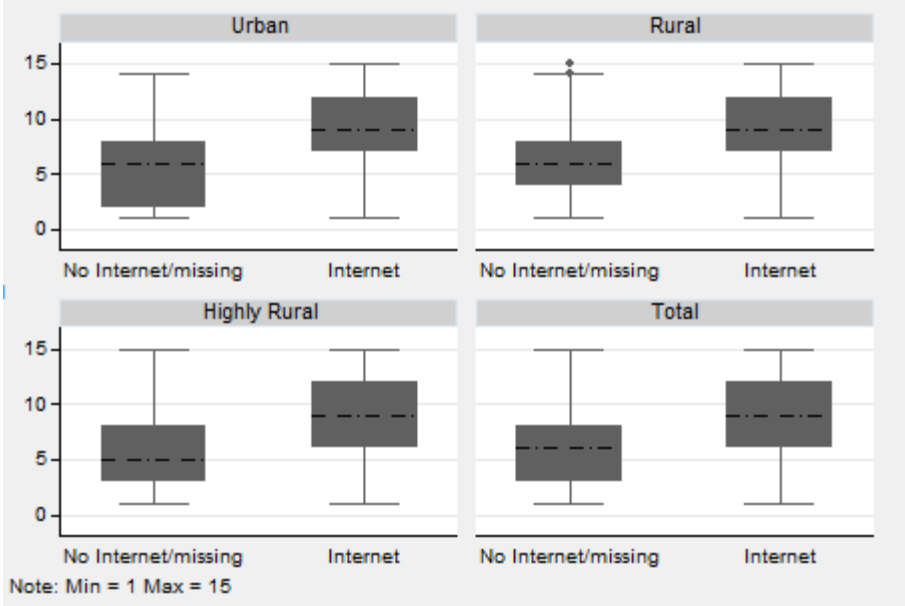


Figure 3: The Distribution of Age by Internet Access and Community Type

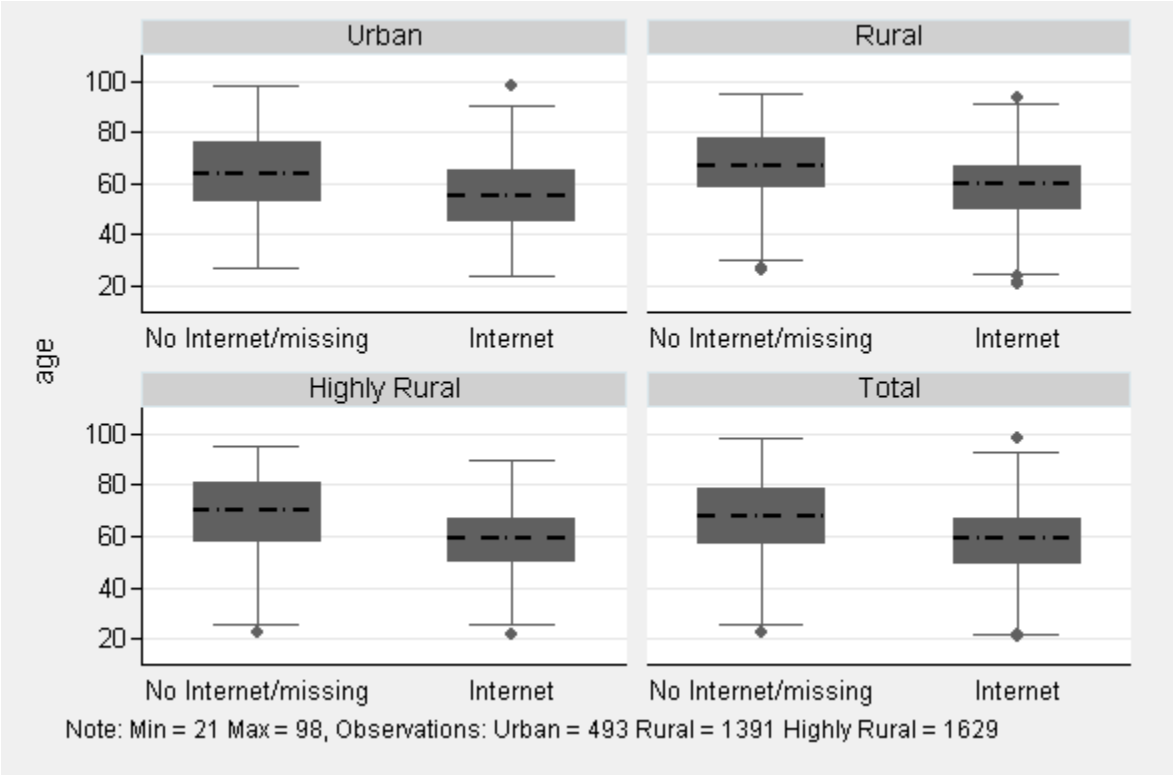
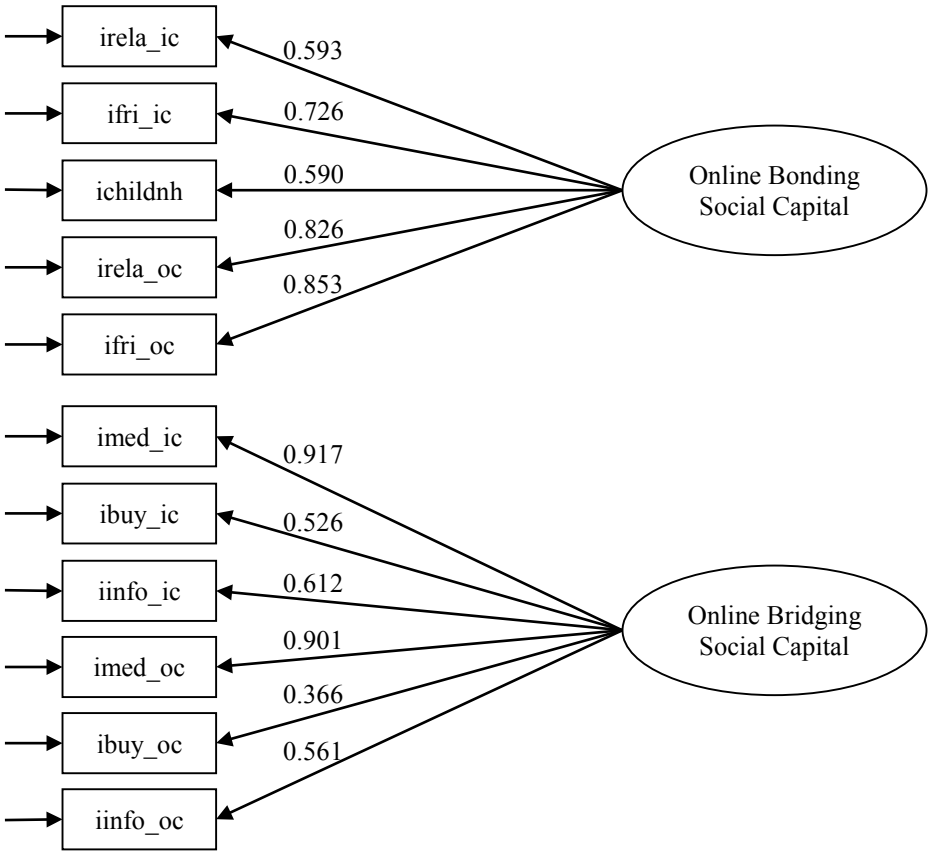
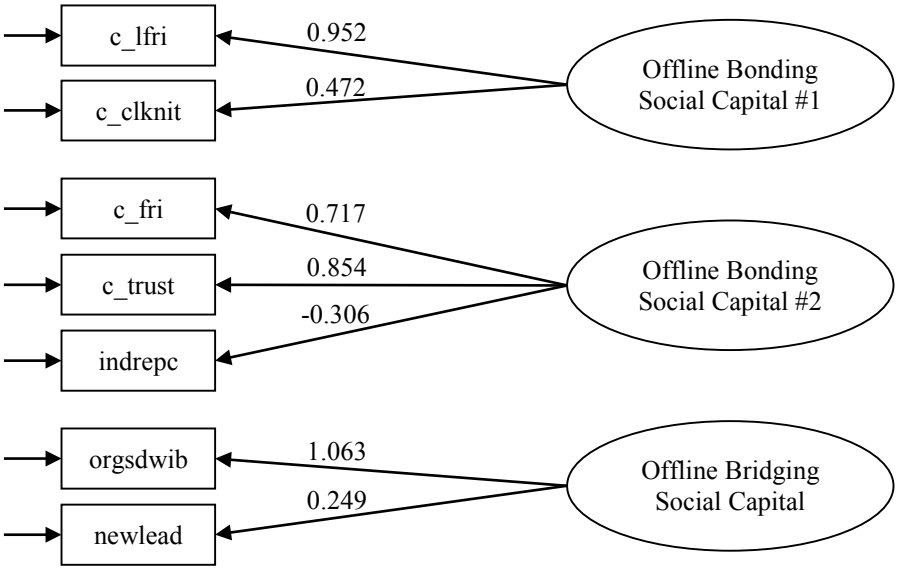


Figure 4: EFA of Online Social Capital



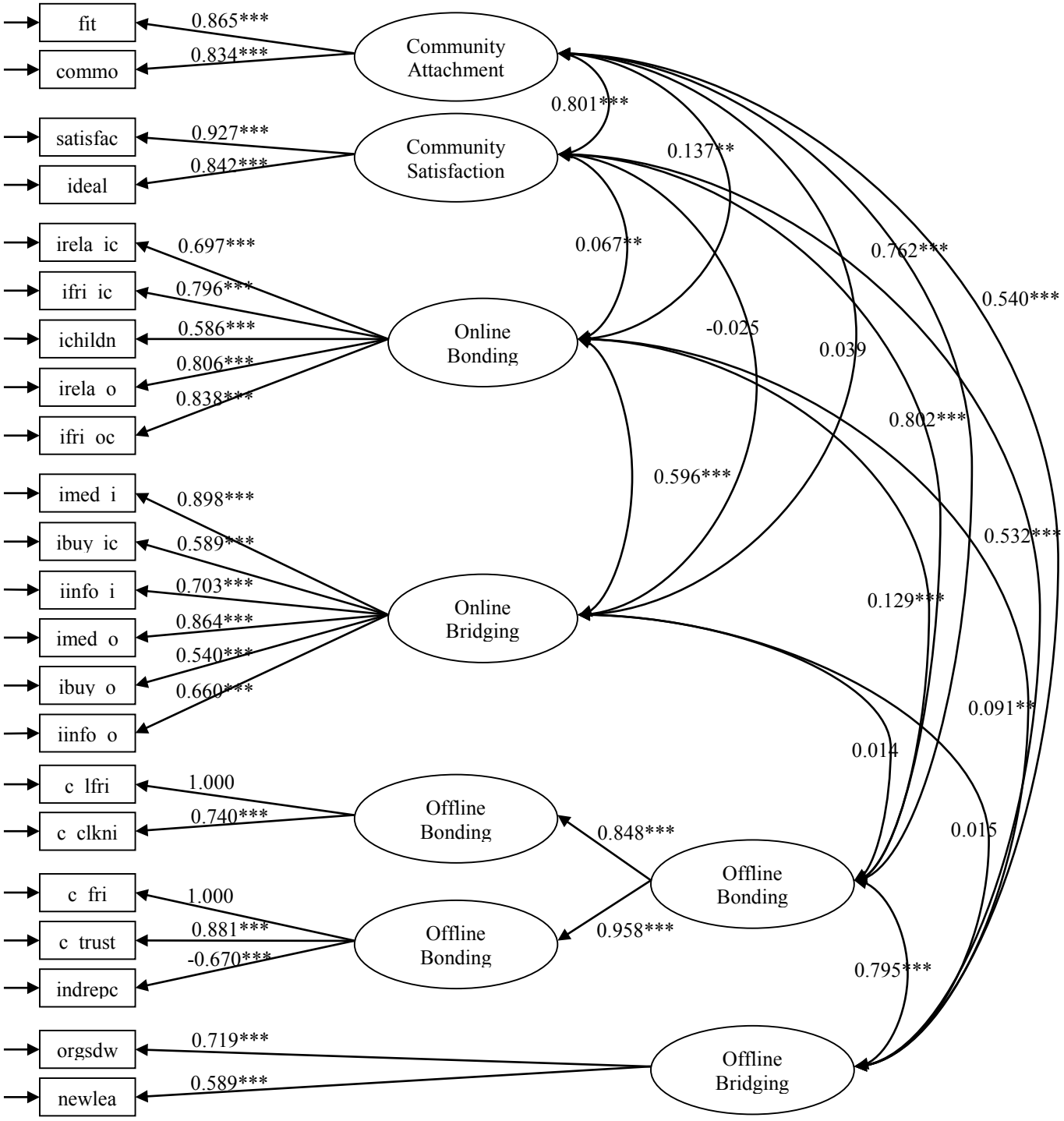
Note: Coefficients are un-standardized

Figure 5: EFA of Offline Social Capital



Note: Coefficients are un-standardized

Figure 6: CFA of all Latent Outcome and Explanatory Variables



Note: Coefficients are un-standardized

Figure 7: Kernel Density Plot of Total Annual Household Income

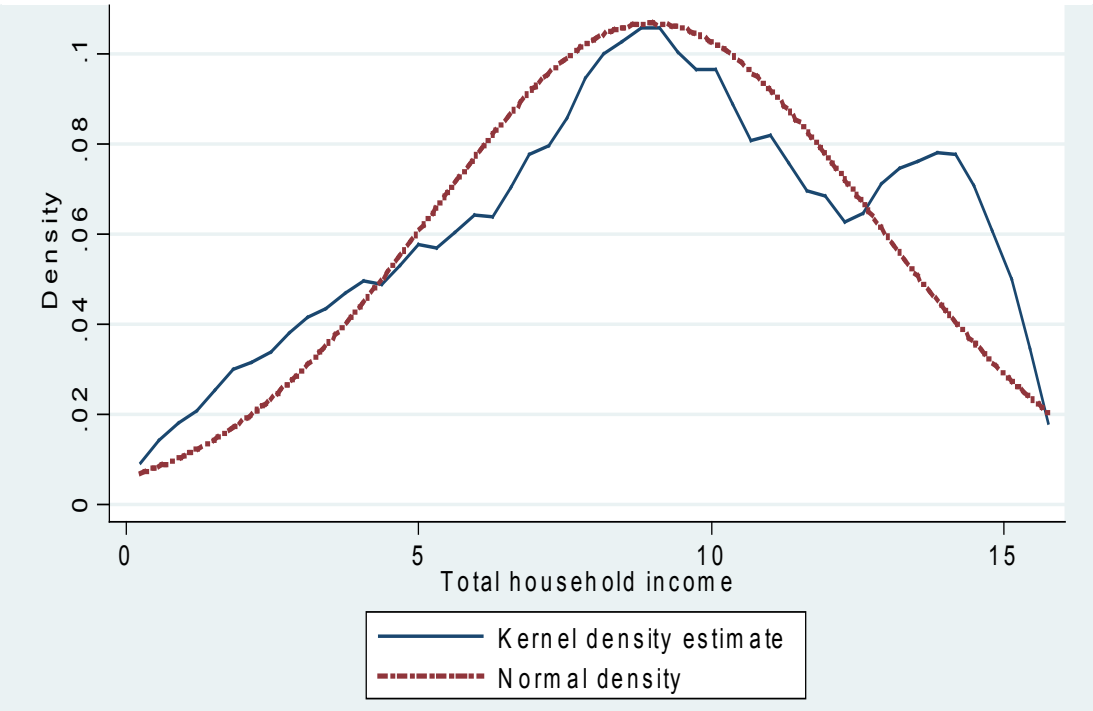


Figure 8: Kernel Density Plot of Respondents' ages

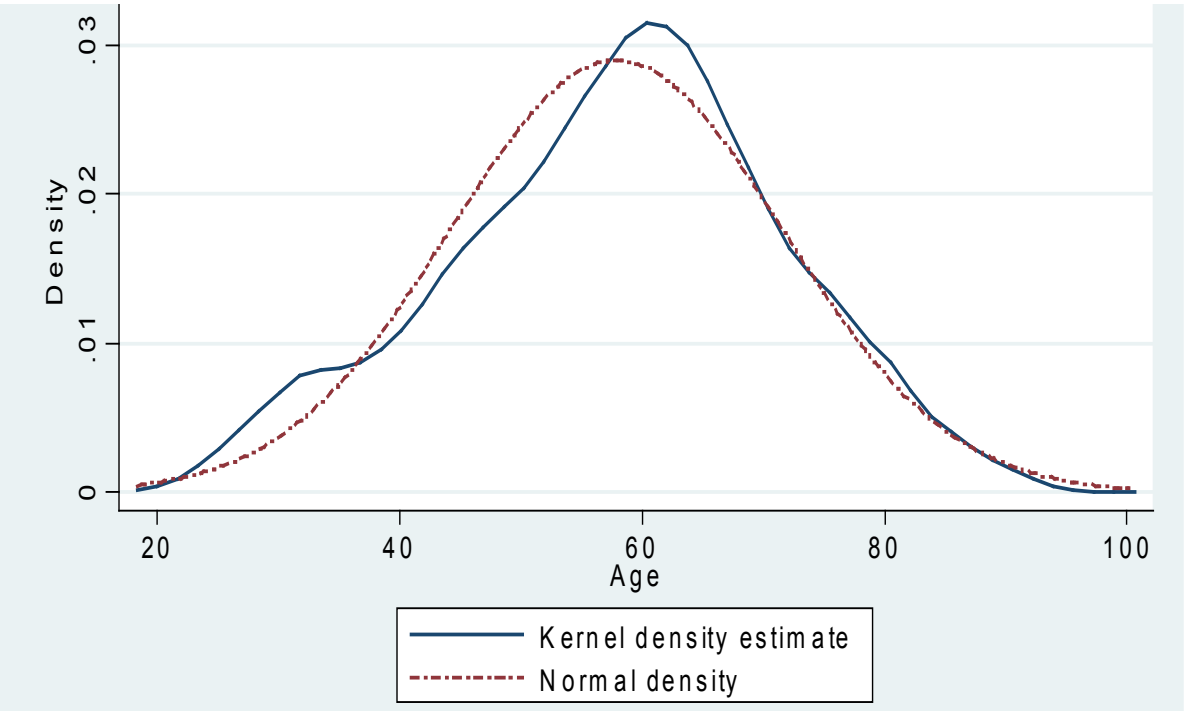


Table 1: Descriptive Statistics for the Loading Variables of Online and Offline Social Capital

Variable Names	Variable descriptions	Mean	Median	SD	Min	Max
c_fri	How friendly are people in your community	5.565	1.248	1	7	5
c_lfri	How trusting are people in your community	5.212	1.239	1	7	5
c_clknit*	Being a resident of this community is like living with a group of close friends	3.153	0.906	1	5	3
c_trust*	The community I live in is closely knit	3.218	0.827	1	5	3
orgsdwib*	Clubs and orgs. In my community are interested in what is best for the community	3.386	0.835	1	5	3
newlead*	Residents in my community are receptive to new residents taking leadership positions	2.945	0.885	1	5	2
indrepc*	I think that "every person for themselves" is a good description of how people are in the community	2.501	0.926	1	5	2
irela_ic**	Other relatives living in your community	1.003	1.744	0	7	0
ifri_ic**	Friends in your community	1.999	2.125	0	7	0
imed_ic**	a doctor, nurse, or health care provider in your community	0.149	0.685	0	7	0
ibuy_ic**	to buy things from business in your local community	0.197	0.689	0	7	0
iinfo_ic**	to get information about evens happening in your community	1.243	1.849	0	7	0
ichildnh**	your children not living at home	1.930	2.232	0	7	0
irela_oc**	other relatives not living in your community	2.178	2.063	0	7	0
ifri_oc**	other friends not living in your community	2.565	2.207	0	7	1
imed_oc**	a doctor, nurse, or health care provider not in your community	0.130	0.659	0	7	0
ibuy_oc**	to buy things from business outside your local community	1.154	1.383	0	7	0
iinfo_oc**	to get information about events happening outside your community	2.003	2.349	0	7	0

* The question is measured on a five point Likert scale

** The question is prefaced with: "About how many days per week do <u>you</u> typically use the internet service <u>in your home</u> to communicate by email, Facebook, Twitter, Myspace, and/or chatrooms with:"

*** The question is prefaced with: "In a typical week, about how many days do <u>you</u> use the internet service <u>in your home</u> for the following:"

Table 2: Descriptive Statistics of the Control Variables

Variables	Mean	Median	SD	Min	Max
Individual level:					
Age ……..	57.89	59	13.76	21	98
Age^2 ……..	3540	3481	1574	441	9604
Total Household income …….....	8.967	9	3.737	1	15
Employed or self employed part or full time ….....	0.602	1	0.490	0	1
Proportion of life spent in the community …….....	0.477	0.433	0.302	0	1
Married ……	0.793	1	0.405	0	1
Female ……..	0.572	1	0.495	0	1
Community level:					
Community is rural ……..	0.409	0.492	0	1	0
Community is highly rural ……..	0.453	0.498	0	1	0
Population size …….....	2.920	3	1.471	1	5

Table 3: Discriminant Validity Tests

	|1 - corr|	std. error	p-value
Online-bonding social capital with Online-bridging social capital	0.368	0.149	0.014
Online-bonding social capital with Offline-bonding social capital	0.646	0.041	0.000
Online-bonding social capital with Offline-bridging social capital	0.871	0.03	0.000
Online-bridging social capital with Offline-bonding social capital	0.793	0.05	0.000
Online-bridging social capital with Offline-bridging social capital	0.864	0.042	0.000
Offline-bonding social capital with Offline-bridging social capital	0.369	0.103	0.000

Table 4: Community Attachment SEM Results

	(1)	(2)	(3)	(4)	(5)
Variable	N = 1980	N = 1950	N = 1813	N = 1806	N = 1806
Online-bonding social capital	0.035	0.060*	0.052	0.056	0.076*
Online-bridging social capital	-0.006	-0.012	-0.008	-0.001	-0.010
Offline-bonding social capital	0.834***	0.860***	0.817***	0.832***	0.822***
Offline-bridging social capital	-0.287***	-0.346***	-0.360***	-0.376***	-0.373***
Age		-0.040*	-0.072***	-0.074***	-0.071***
Age^2		0.000*	0.001***	0.001***	0.001***
Proportion of life in community		1.586***	1.577***	1.587***	1.525***
Total annual household income			0.070***	0.064***	0.062***
Employed			0.208	0.215	0.209
Female				0.166	0.159
Married				0.196	0.191
Rural					0.031
Highly rural					0.159
Population size					0.025
Fit Statistics					
RMSE	0.050	0.045	0.039	0.037	0.036
SRMR	0.069	0.065	0.065	0.063	0.064
CFI	0.971	0.967	0.966	0.965	0.963
TLI	0.965	0.962	0.961	0.960	0.956

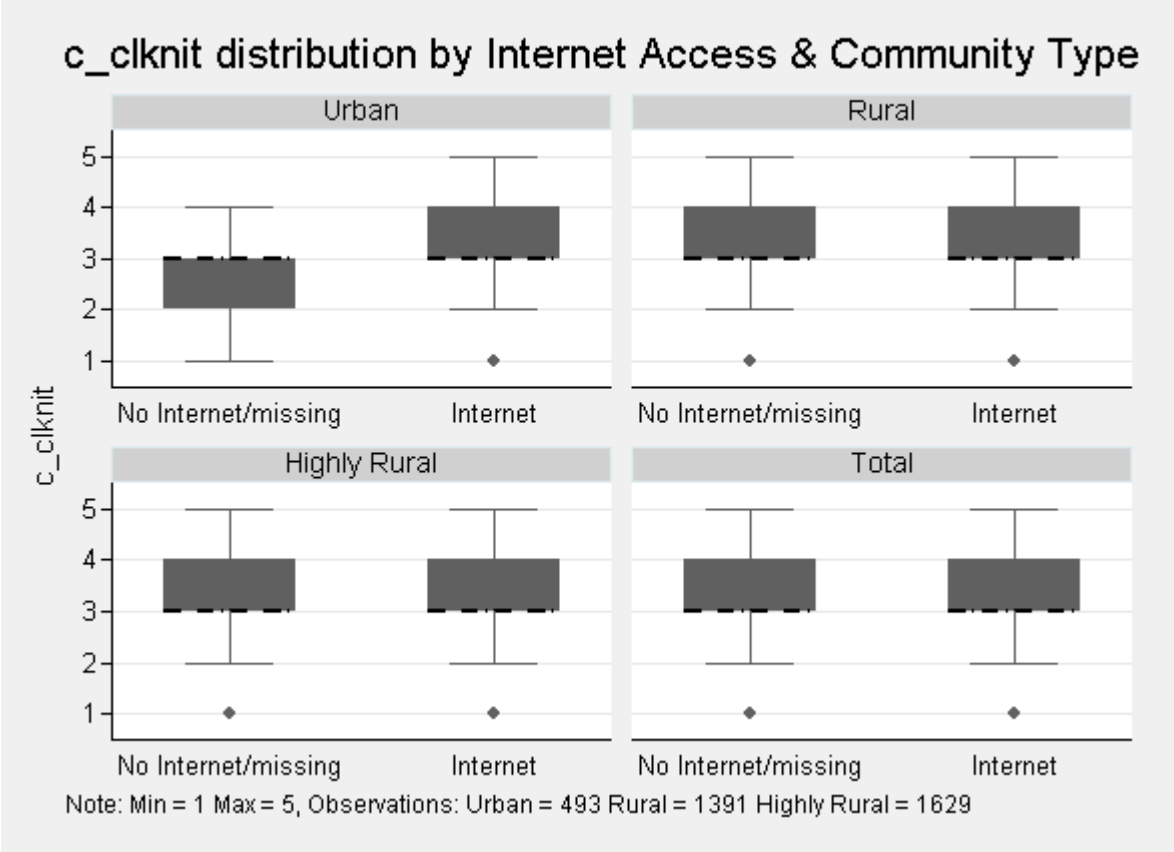
*** p < 0.001 ** p < 0.01 * p < 0.01

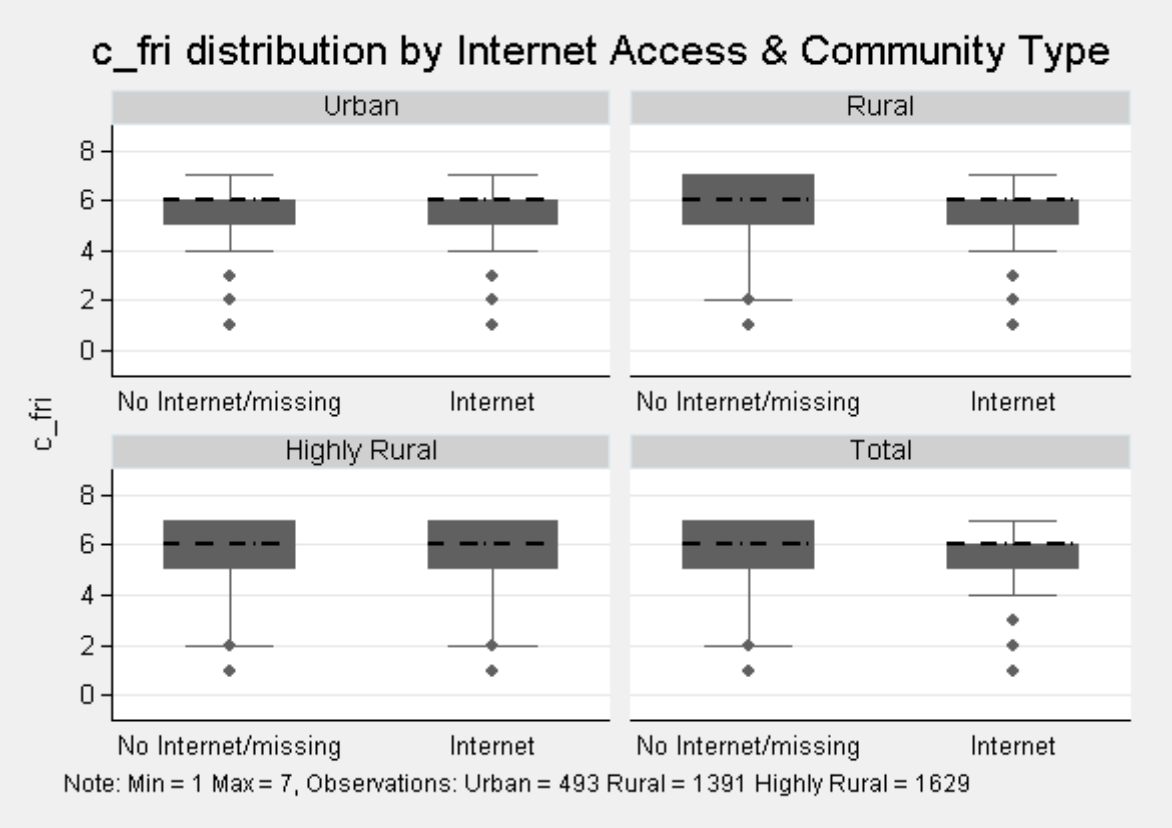
Table 5: Community Satisfaction SEM Results

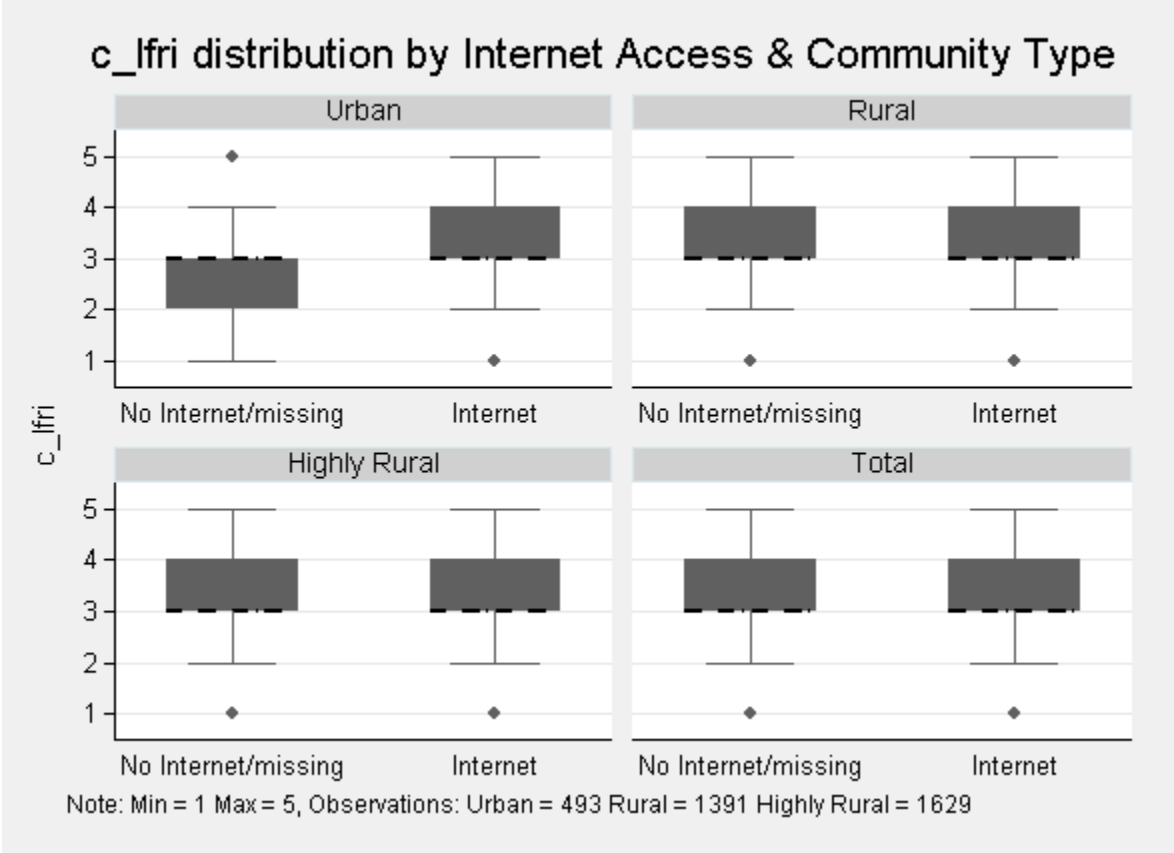
	(1)	(2)	(3)	(4)	(5)
Variable	N = 1980	N = 1950	N = 1813	N = 1806	N = 1806
Online bonding	0.006	0.006	-0.005	0.018	0.006
Online bridging	-0.020	-0.020	-0.010	-0.030	-0.019
Offline bonding	1.325***	1.325***	1.236***	1.234***	1.258***
Offline bridging	-0.693***	-0.693***	-0.623***	-0.604***	-0.611***
Age		-0.121***	-0.141***	-0.139***	-0.136***
Age^2		0.001***	0.002***	0.002***	0.002***
Proportion of life in community		1.297***	1.339***	1.346***	1.358***
Total annual household income			0.056***	0.051*	0.050*
Employed			-0.034	-0.065	-0.068
Female				-0.039	-0.040
Married				0.155	0.158
Rural					0.207
Highly rural					-0.123
Population size					-0.010
Fit Statistics					
RMSE	0.050	0.045	0.039	0.037	0.036
SRMR	0.069	0.065	0.065	0.063	0.064
CFI	0.971	0.967	0.966	0.965	0.963
TLI	0.965	0.962	0.961	0.960	0.956

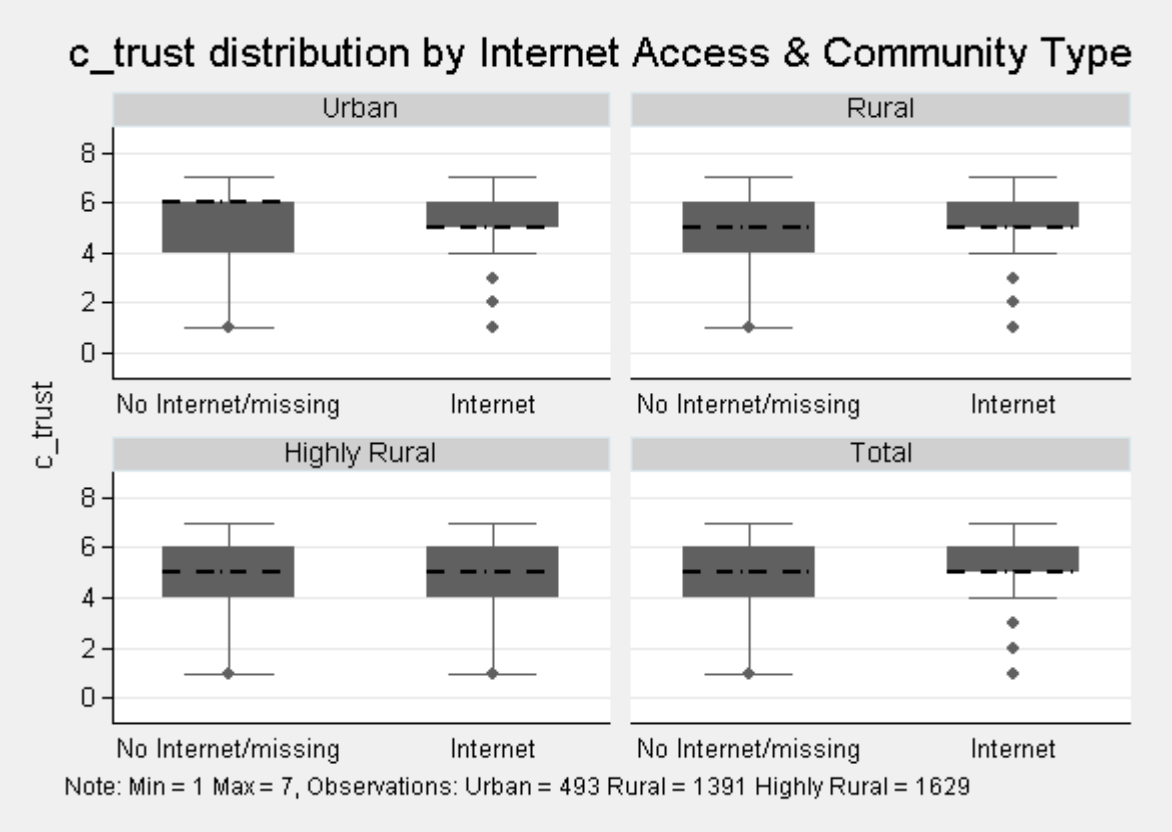
*** $p < 0.001$ ** $p < 0.01$ * $p < 0.01$

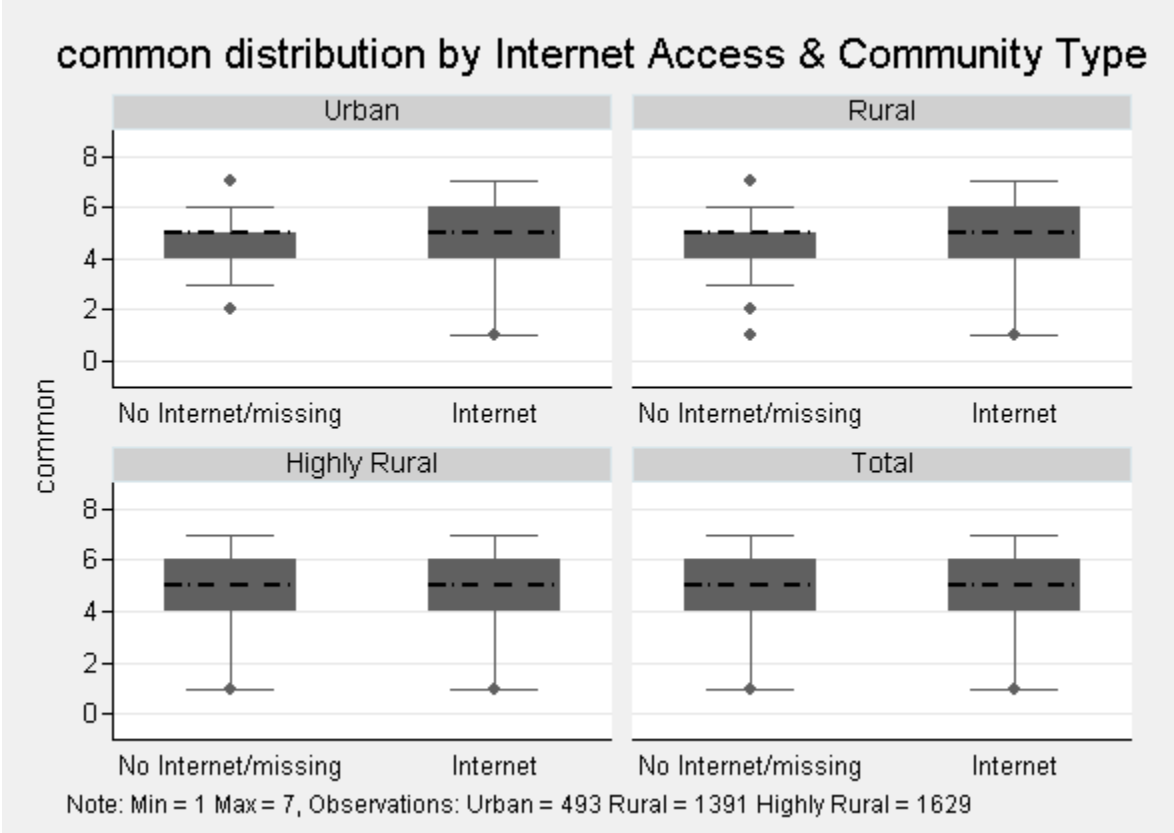
Appendix 1: An overview of variations in the observed variables used in the creation of the latent variables: online-bonding social capital, online-bridging social capital, offline-bonding social capital, and offline-bridging social capital between individuals with and without in-home Internet access over the various types urban, rural, and highly rural

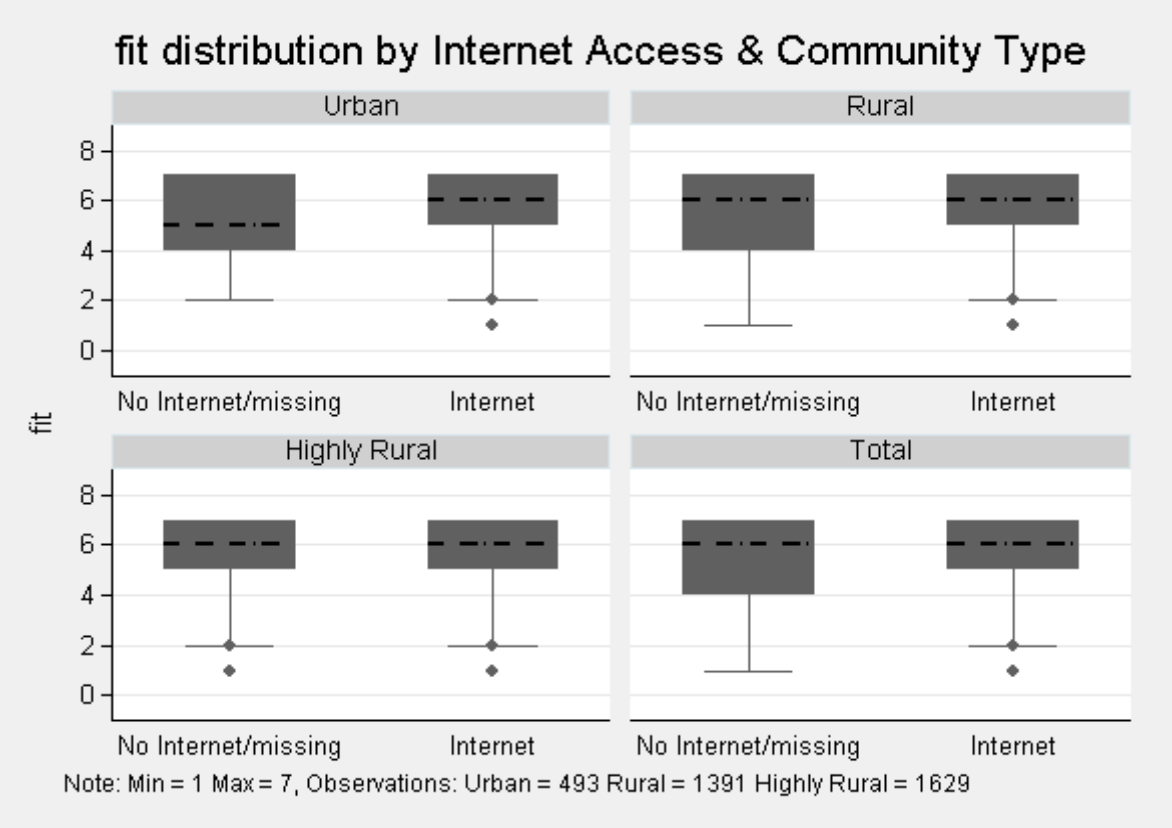


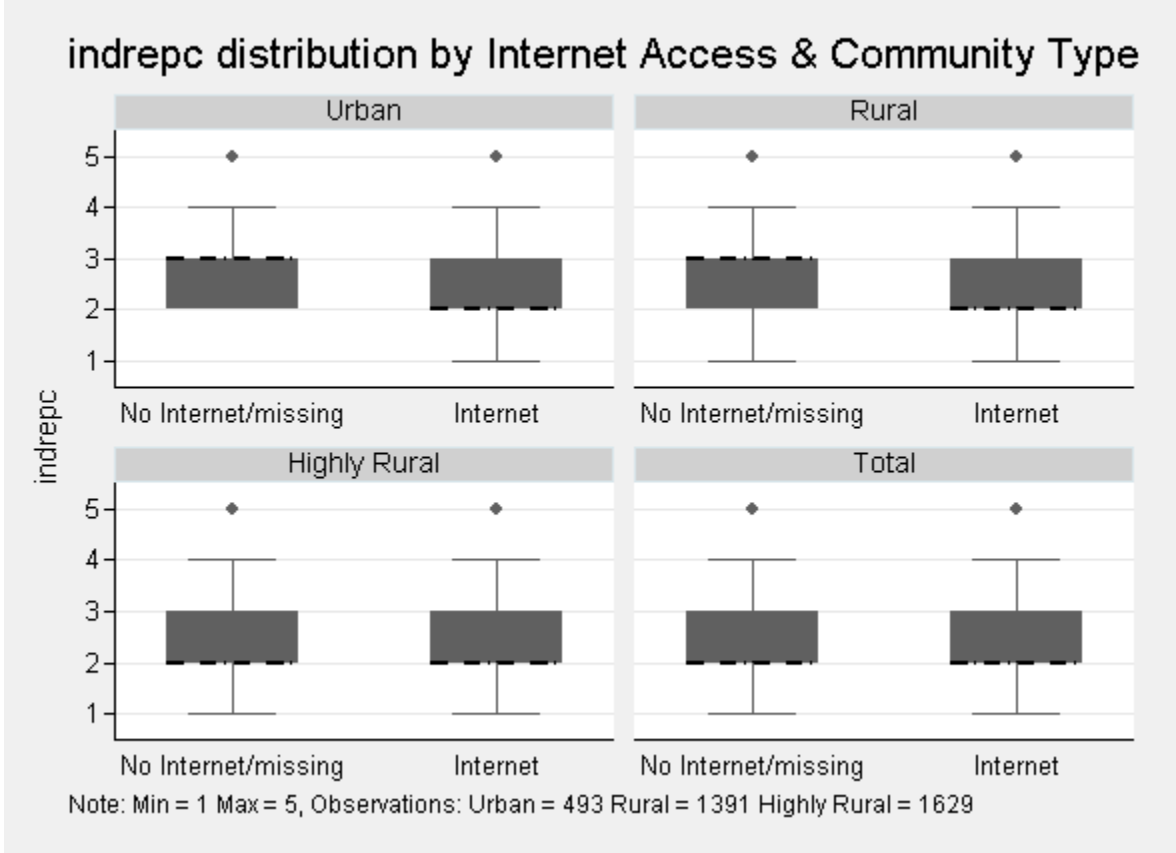

c_fri distribution by Internet Access & Community Type
Urban
Rural
Highly Rural
Total
c_fri
0
2
4
6
8
No Internet/missing
Internet
Note: Min = 1 Max = 7, Observations: Urban = 493 Rural = 1391 Highly Rural = 1629

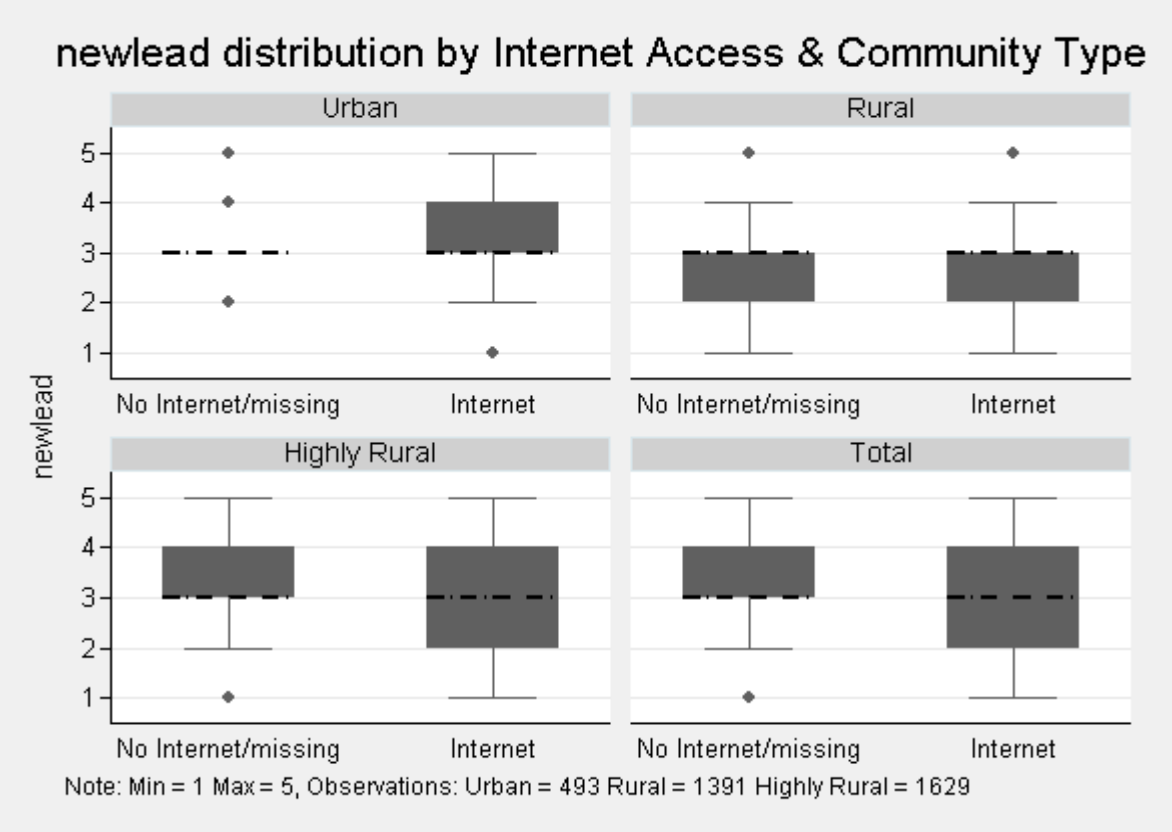

c_lfri distribution by Internet Access & Community Type
Urban
Rural
Highly Rural
Total
c_lfri
1
2
3
4
5
No Internet/missing
Internet
Note: Min = 1 Max = 5, Observations: Urban = 493 Rural = 1391 Highly Rural = 1629

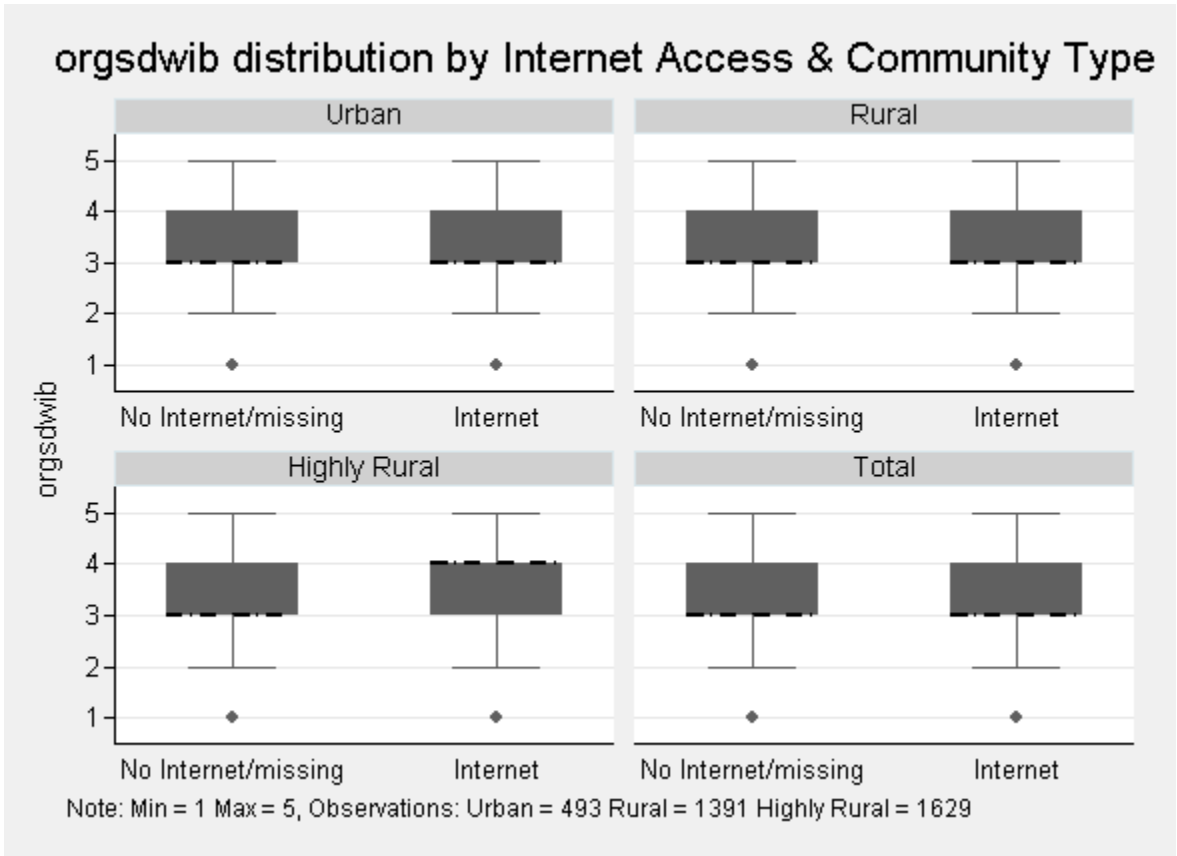

c_trust distribution by Internet Access & Community Type
Urban
Rural
Highly Rural
Total
c_trust
0
2
4
6
8
No Internet/missing
Internet
Note: Min = 1 Max = 7, Observations: Urban = 493 Rural = 1391 Highly Rural = 1629


common distribution by Internet Access & Community Type
Urban
Rural
Highly Rural
Total
common
0
2
4
6
8
No Internet/missing
Internet
Note: Min = 1 Max = 7, Observations: Urban = 493 Rural = 1391 Highly Rural = 1629

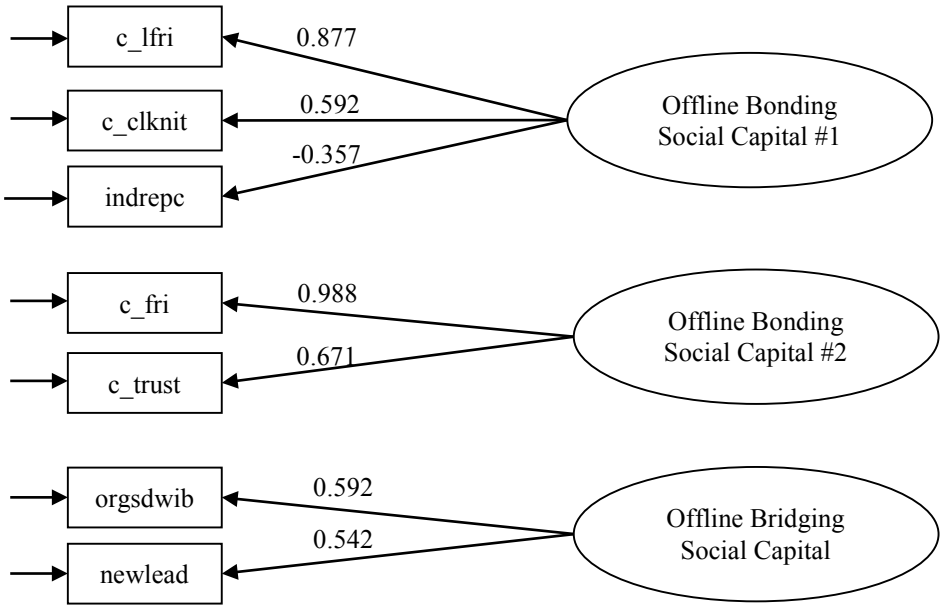

fit distribution by Internet Access & Community Type
Urban
Rural
Highly Rural
Total
fit
0
2
4
6
8
No Internet/missing
Internet
Note: Min = 1 Max = 7, Observations: Urban = 493 Rural = 1391 Highly Rural = 1629


indrepc distribution by Internet Access & Community Type
Urban
Rural
Highly Rural
Total
indrepc
1
2
3
4
5
No Internet/missing
Internet
Note: Min = 1 Max = 5, Observations: Urban = 493 Rural = 1391 Highly Rural = 1629


newlead distribution by Internet Access & Community Type
Urban
Rural
Highly Rural
Total
newlead
1
2
3
4
5
No Internet/missing
Internet
Note: Min = 1 Max = 5, Observations: Urban = 493 Rural = 1391 Highly Rural = 1629

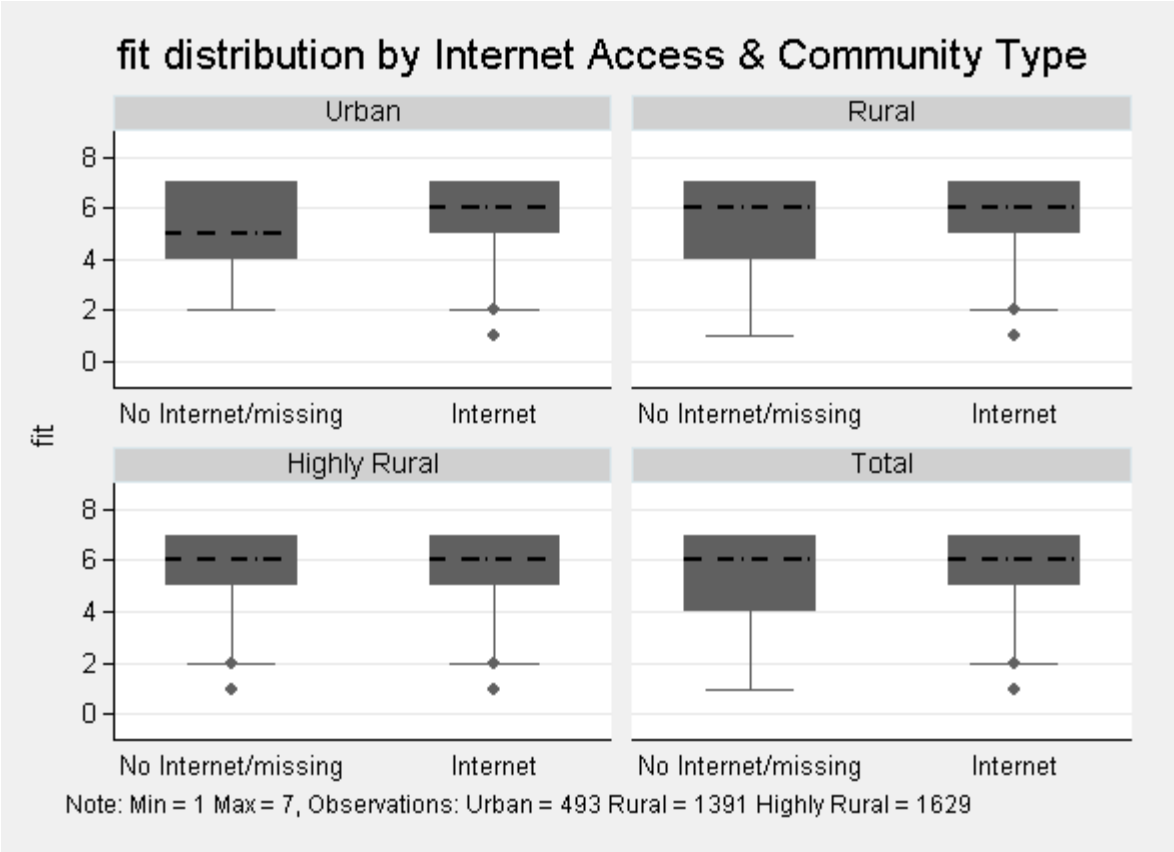

orgsdwib distribution by Internet Access & Community Type
Urban
Rural
Highly Rural
Total
orgsdwib
1
2
3
4
5
No Internet/missing
Internet
Note: Min = 1 Max = 5, Observations: Urban = 493 Rural = 1391 Highly Rural = 1629

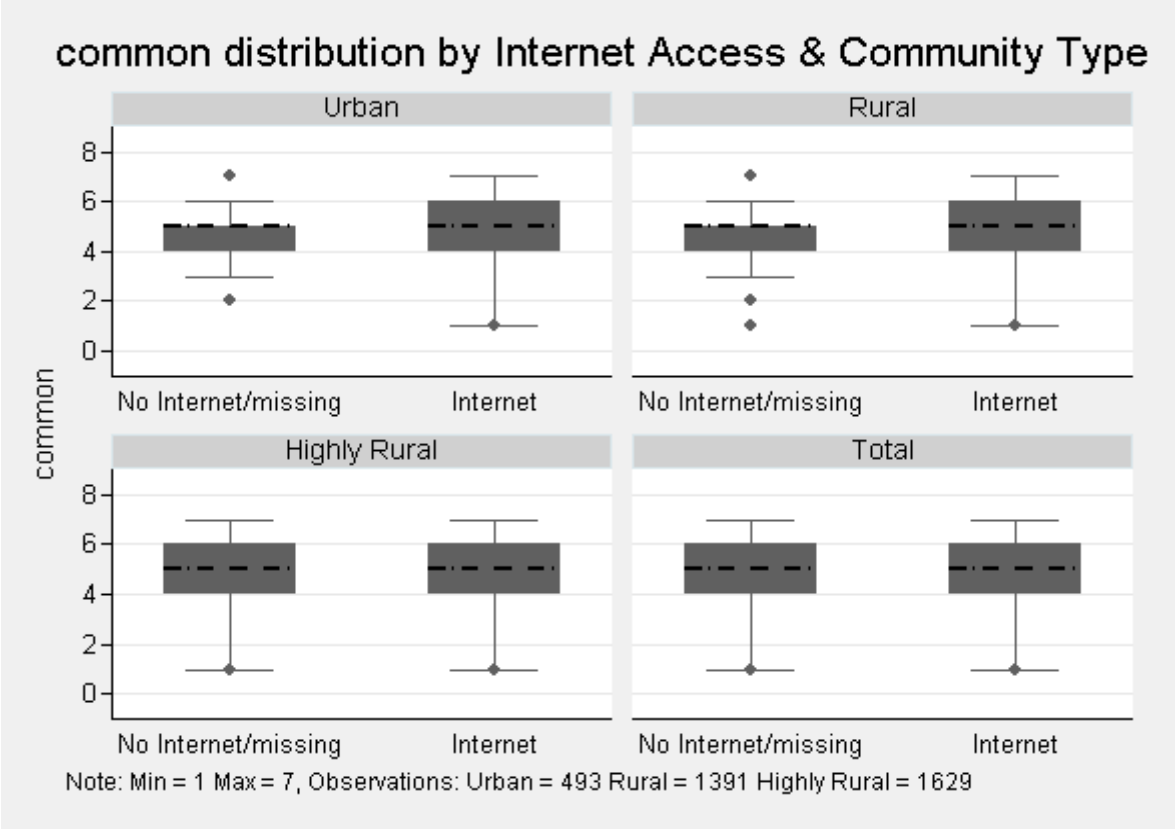
Appendix 2: EFA of Offline Social Capital for Individuals without In-home Internet Access - Unstandardized Results

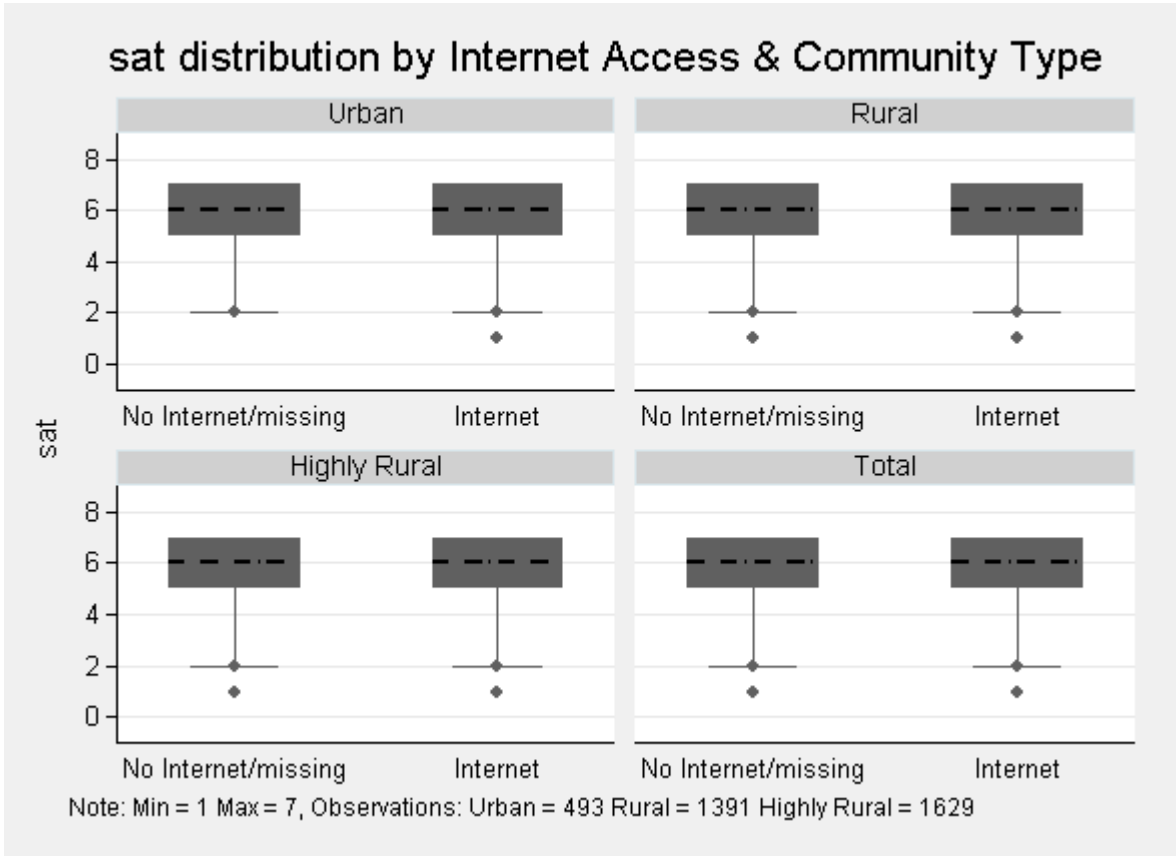


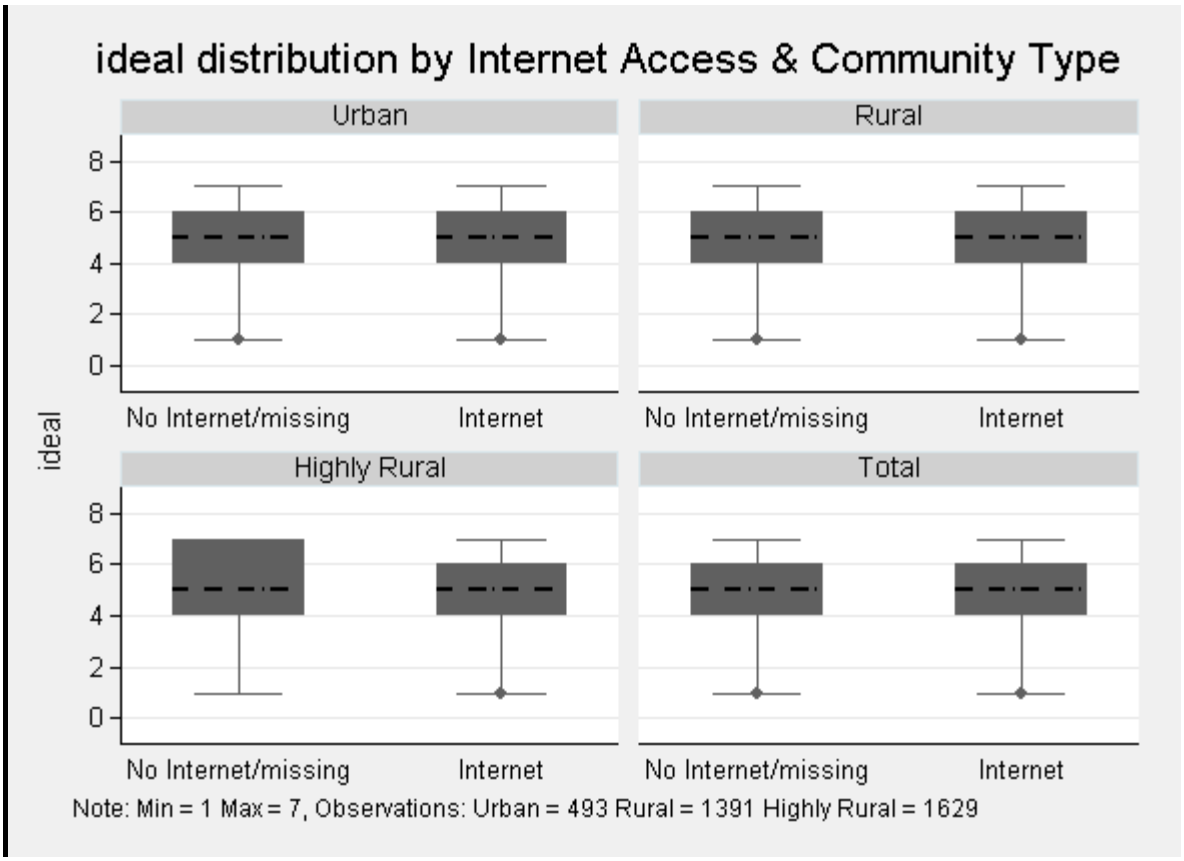
Fit Statistics	
RMSEA	0.005
CFI	1.000
TLI	1.000

Appendix 3: An overview of variations in the observed variables used in the creation of the latent variables community attachment and community satisfaction between individuals with and without in-home Internet access over the various types urban, rural, and highly rural




common distribution by Internet Access & Community Type
Urban
Rural
Highly Rural
Total
common
0
2
4
6
8
No Internet/missing
Internet
Note: Min = 1 Max = 7, Observations: Urban = 493 Rural = 1391 Highly Rural = 1629


sat distribution by Internet Access & Community Type
Urban
Rural
Highly Rural
Total
sat
0
2
4
6
8
No Internet/missing
Internet
Note: Min = 1 Max = 7, Observations: Urban = 493 Rural = 1391 Highly Rural = 1629


ideal distribution by Internet Access & Community Type
Urban
Rural
Highly Rural
Total
ideal
0
2
4
6
8
No Internet/missing
Internet
Note: Min = 1 Max = 7, Observations: Urban = 493 Rural = 1391 Highly Rural = 1629

Appendix 4: CFA of Offline Social Capital, Community Attachment, and Community Satisfaction for Individuals without In-home Internet Access - Standardized Results