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Emma S. Spiro
Pomona College

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Searching for Community Online: How Virtual Spaces Affect Student Notions of Community

Emma S. Spiro

Submitted to: Marianne de Laet and David Tanenbaum

Science, Technology, and Society Program
Pomona College

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Abstract

Social networking sites and virtual spaces have flourished in the past few years. In this thesis I explore the impact of such social networking services on the local community at a small liberal arts college. To begin, I investigate modern trends in community theory. Defining community has become more difficult in modern society, where community is no longer easily distinguished by geographical boundaries. From the background of modern community theory I explore the designation of virtual spaces as “virtual communities.” Literature and research about virtual spaces indicates that they can provide many of the values thought to be inherent to community membership. This thesis incorporates research on one specific case study: through mathematical and ethnographic research of Facebook.com, I will evaluate the opinions of students in considering virtual spaces as communities. The strong localized community on campus makes students hesitant in calling Facebook a “virtual community,” despite its strong integration with the face-to-face community itself. Instead, Facebook is seen as simply a tool.

Chapter 1

Introduction

Where does modern community exist? Communal spaces and the production of social capital are vital to sustaining human society. With increasing momentum social spaces are moving online - media hype promotes virtual spaces as the next big innovation in modern culture. Online social networking, Web 2.0, blogs: these Internet technologies open a new sphere of public interaction and communication. Insofar as they promote social capital, these buzz technologies are eagerly adopted by the general public, but is society simply caught up in a new wave of novelty? The impact and social consequences of Internet use have always been a lingering question in my thoughts. Is the future of our society in a cubicle or will face-to-face communities continue to enrich human experiences? The Internet has arguable become one of the most powerful technologies in modern society in that its impact on society extends to so many different aspects of life. From the perspective of STS studies, exploring the Internet as an artifact provides a new approach to its use and influence. As part of my thesis, I wanted to look at the impact of virtual communities on public notions of community. Because of my experiences over the past four years, I wanted to incorporate a mathematical component to anthropological approaches to studying community. In my thesis, I will look specifically at the social networking utility Facebook.com. By combining empirical ideas of social network analysis with an ethnographic exploration of Facebook use, I want to explore the curious interaction between virtual spaces and face-to-face communities on a small college campus.

In the first chapter, I will investigate the basic technology behind the advent of the Internet itself. This technology provides the means for Internet communication and the formation of virtual spaces. In Chapter 2, I present the history of community theory and the sociological and psychological basis for the value of community in human society. It is necessary to define community in order to give a framework of comparison for virtual spaces. Next, I explore the history and current research on virtual communities themselves. Researchers currently find many aspects of community in virtual spaces and are inclined to call Internet groups “communities.” Specifically, I want to examine the trend to analyze virtual communities in terms of social networks. Chapter 5 explores the idea of mapping social networks and the mathematical theories of networks that can be applied to community. Chapter 6 is a case study of the social networking service Facebook.com. I will evaluate the service from both a mathematical and ethnographic background, hopefully determine some of the affects of virtual spaces on student notions of community and community itself.

Chapter 2

Development of the Internet

The Internet has revolutionized the communications world. Today, the Internet is a widespread information infrastructure whose influence reaches not only technical fields, but all aspects of modern society and culture. The concept of the Internet was first discussed amongst a small group of computer science researchers investigating local networking capabilities. The idea of computer networks was to allow efficient communication among computer users. Their experimentation exploded across the country turning what began as a small project into a widespread infrastructure used in commercial, personal and governmental enterprises. The Internet's technological underpinnings define the network itself in that they restrict certain activities and encourage other, for instance it is not possible to "send" smells through Internet technology, but we can share visual and audio stimuli. Because of this technological determinism, it is important to gain a basic understanding of where and how Internet technology has developed.

During the 1960s, the idea of a decentralized computer network made of individual nodes was discussed in detail by researchers at the University of California Los Angeles (UCLA), the Massachusetts Institute of Technology (MIT) and the RAND Corporation. The topic gained enthusiasts during the Cold War as a possible method for communication after a nuclear war or disaster. The Pentagon's Advanced Research Projects Agency (ARPA) decided to fund the project, and in 1969 the first network node was installed in UCLA. After four such nodes had been installed the network was named ARPANET, after its sponsor. Within just a few years of its construction the net-

work had become a hub for electronic mail. Interestingly enough, the majority of communication via the network was locally centralized, instead of the originally predicted global information exchange. Throughout the 1970s and 1980s different groups were able to link computers to the growing network, forming a complex web of communication. The growing network eventually became known as the “Internet” or the “Net”. Just twenty years after its formation, ARPANET formally expired, in some sense the victim of its own success. The growth of the Internet though the 1990s and in recent years has been astounding. As it continues to become cheaper, faster, and more readily available, its growth has become exponential. Today, the Internet has surpassed all expectations; it has become an integral part of social society and modern culture.

It is important to recall that Internet applications cannot move beyond their technical architecture. Yet, still, the influence of the Net has reached beyond what anyone imagined. Perhaps, as evidenced by their explosion and presence on the Net, one of the most encouraging Internet phenomena is the rise of “online communities” built through text-based interaction (recently this also includes visual- and sound-based communication). “The Internet is as much a collection of communities as a collection of technologies, and its success is largely attributable to both satisfying basic community needs as well as utilizing the community in an effective way to push the infrastructure forward.” [Leiner et al., 1997] The degree to which society has embraced and participated in the development of online communities speaks to the need of this social space; they seem to fill a current cultural void.

In the interest of clarity, we must distinguish between the Internet and the World Wide Web (WWW) briefly. The history of the Internet dates back significantly farther than the World Wide Web. Yet when most people think of “the Internet” they think of the global information medium, the WWW, connected via the Internet. The Internet is essentially the hardware behind the Web. The Internet itself consists of a collection of interconnected computers: a hardware network connected by wires and fiber-optic cables. The WWW, on the other hand, was developed by the European Organization for Nuclear Research (commonly known as CERN) in the 1980s. Early adopters of the Web were mainly university-based scientific departments, but its commercialization has rapidly increased the range of possibilities available on the Web. Both the Internet itself

and the Web have opened spheres for online “community” building. Most notably, in recent years have been the explosion of social networking websites.

A social networking service is a piece of software or Web based application specifically designed to promote and help build online social networks and communities. As of 2005, there were over three hundred known social networking websites, including the prominent websites MySpace, Facebook, and Friendster. Vital to social networking sites are communication devices. Programs like Instant Messaging, Email, etc have supported the formation of online communities through online communication, known as computer-mediated communication (CMC). The Internet has become an efficient and popular means of communication and socializing which means that the Internet itself plays an increasingly important role in everyday life. Throughout the next few chapters, we will explore at the impact of these technologies on building and maintaining communities and social networks, but first we must provide a context for examining community itself.

Chapter 3

Community Theory

3.1 Introduction

In 1915, C.J. Galpin published a study on rural agricultural areas and formally coined the term *community*. Since then there have been numerous competing definitions and ideas about the nature, components, instances and value of community in human life. These different definitions concern community as a geographical area, an area of common life, a group of people with similar interests, etc. [Smith, 2005] They deal with the reasons for community participation and the benefits of community membership. Defining community presents a significant challenge. The word has been used in many different contexts and with many distinct connotations. Although each of the many definitions may be specific to a discipline or situation, they seem to share common elements or ideas by which community exists, such as social interaction among people, and a common tie or interest. Most definitions of community also involve a relationship between the community itself and its individual members; this relationship involves individuals' responsibility for serving a common good but also the community's responsibility of serving the needs of its individual members. [Cook, 1994] [Hoggett, 1997]

The community (or communities perhaps?) we live and participate in influence each of us in many important ways. They influence our needs, perceptions, values, attitudes and behaviors. We define both identity and our sense of self in response to our relationships and interactions with

others. Beyond basic needs, communities provide a sense of belonging and a guide for both social and spiritual development. As such, our simultaneous membership in many different communities, each with different influences, serves to build a picture of who we are. Different communities, however, may influence individuals in competing manners. These differences are vital to understanding action and behavior, values, the roles individuals play in communities, etc. These are points of interest to the field of community theory. Due to its widespread applicability, community theory has become a necessary component of many social sciences including, sociology, anthropology, and psychology. [Chavis and Pretty, 1999]

3.2 Literature Overview

The notion of communities or groups, though it lacked a formal term or definition, dates back to Aristotle, who saw what we can now call community as the context within which a group perfected common life. Aristotle's notion promotes the interdependence of individuals and groups. Goerg Wilhelm Friedrich Hegel, the well known political and social philosopher, also provided a context for future theories of community in his belief that individuals consummate a full existence in their social lives. From this, it follows that anyone who feels self-sufficient in isolation simply lacks insight into his or her own fundamentally social nature. Karl Marx shared Hegel's view that community was a result of the human need for social interaction. Marx believed that genuine community results from the need and egoism of individuals, not from mere thinking or reflection. Existentialist philosopher Søren Kierkegaard argued that genuine community emerges only when the egoism of individuals has been transformed into unselfish benevolence. Thus, social affiliation in itself does not provide the condition necessary for building a viable community. [Jardine, 2006]

One of the founding texts in the history of community theory was written by German sociologist Ferdinand Tönnies in 1887. His work *Gemeinschaft and Gesellschaft* presents a sociological theory of community by making a distinction between community and society. His idea of *Gemeinschaft* (community) was based on the subjective or essential will of the members. That is, its very existence is based on the consciousness of belonging together and the collective affirmation of mutual dependence. This shared togetherness results from the essential will, in which individ-

ual members see themselves as a means to serve the goals of the group. This characterization makes *Gemeinschaft* fundamentally different from *Gesellschaft*. For Tönnies, *Gesellschaft* (society) is a grouping based on rational or arbitrary will. This type of group is built around purposefully types of relationships. Rational will is characterized by an individual approach to the social group as a means to further his or her own individual goals. Therefore, *Gemeinschaft* and *Gesellschaft* are essentially opposites in terms of an individual's motivation for becoming part of a social group. *Gemeinschaft* and *Gesellschaft* are each characterized by different, mostly opposing, components as seen below. [Jardine, 2006]

Gemeinschaft	Gesellschaft
<ul style="list-style-type: none"> ● strong identity with community ● emotionalism/sentiment ● traditionalism ● holistic relationships with other members ● Example: family, local neighborhoods 	<ul style="list-style-type: none"> ● no identification with community ● affective neutrality ● legalism ● segmental conceptions of other members ● Example: company, state in modern society

The distinction between and *Gemeinschaft* (community) and *Gesellschaft* (society) represents an important foundation of community theory and community studies. Tönnies's distinction is valuable to consider in evaluating different kinds of social groups. What groups can be called communities? Can we identify specific elements that turn social groups into communities? Tönnies identifies community as something beyond the basic social group of society, something more because of the interest and investment of each community member. The ideal, clearcut distinction between society and community, however, is rarely seen in practice; most social groups are a combination of the two ideas. This overlap occurs as a result of the differing approaches to the community by its members - there is a broad scale of participation and responsibility. Whatever the distinction, it is clear that community must and does exist in human life.

From the history of community theory and subsequent community discussions we gain an important theme: community is an essential component of human life. Early philosophers believed

that human beings were social animals, that communities were *needed* in human life. Historically, much of the discourse on community theory stems from a political background; theorist sought to explain the reasons human beings naturally enter into social contracts. Contemporary issues of community theory have moved away from these ideas to explore the value of community in human life and the new social contexts from which community can be defined. Even if it cannot be easily identified, we know community must exist.

Building community is a process of communication and action. Communication is a vital aspect in community formation because it is the means by which human beings interact. Whether visual, auditory, etc. communication allows human beings to share experiences. [Lin and Atkin, 2002] Many new theories of community are based upon the idea that people create communities around shared values rather than just geographical proximity. Central to this notion is the idea that people may simultaneously be members of multiple communities. The Multiple Communities Theory can be explained with six characteristics. [Wood and Judikis, 2002]

1. Every adult holds simultaneous membership in several communities.
2. Each community exercises influence on individual needs, perception, values, attitudes, and behaviors.
3. The influences of the different communities are sometimes harmonious and reinforcing , sometimes disharmonious and conflicting.
4. Behaviors by individuals can be understood in terms of collective experiences and influences within and across communities.
5. The similarities and contradictions in the influences of communities, as well as the specific nature of those influences, are important in determining and understanding the needs, values, perceptions, attitudes, and behaviors of individuals.
6. Relationships between communities affect the roles people play within communities and across communities.

Being a member of multiple communities makes it difficult to think of community as a distinct entity; in reality it is a web of connections - family, friends, social groups, and potential connections. Modern community is no longer restricted by geographical boundaries. There are two common ways of approaching the idea of modern community theory. The first approaches community as a *value*. In this sense, community serves individuals directly by providing a sense of kinship

and trust, as well as a sense of commitment and solidarity (both from individual members and the community itself). This characterization places significant weight on the value of community; it turns community into a support system and encourages the emotional bond among community members. The second approach to the idea of community theory characterizes community as a descriptive entity. From this viewpoint, community can be seen as a place, interest, or communion. Most of the well-known or common uses of the term community interpret community as a descriptive entity. Communities of faith, neighborhoods, ethnic origin and work place all fall under this category.

Wood and Jukidis present an overview of recent community theory in their book, *Conversations on Community Theory*. As they present current ideas about community, they formulate what they believe are six essential elements of community. The following six elements are a summary of what they consider to be the common threads in modern community theory. [Wood and Judikis, 2002]

1. A sense of common purpose(s) or interest(s) among members.
2. An assuming of mutual responsibility.
3. Acknowledgment (at least among members) of interconnectedness.
4. Mutual respect for individual differences.
5. Mutual commitment to the well-being of each other.
6. Commitment by the members to the integrity and well-being of the group, that is, the community itself.

To better understand how modern community theorists define community, consider each of the elements above. Most people begin defining community in terms of a common purpose or shared interest among members; this element is rarely debated and intuitively understood by the general public. The other essential elements, however, might need more explanation. One might object to the idea of assuming mutual responsibility by pointing out that communities often contain irresponsible members. However, this element is about individuals taking responsibility for what the community is and does; without this sense of responsibility community does not exist - it would fall apart. A community requires acknowledgment from its members and with this

acknowledgment comes the sense of responsibility. The second element recognizes interconnect-
edness. A community connects people, and all members are aware of their interrelationships. In
some sense the feeling of being connected to a group is a motivation for joining a community.
The requirement of mutual respect is also troubling. Judikis and Wood argue that a “community”
lacking respect is not a community. This is not to say that community never involves insolent dis-
agreement or tension. In fact, the requirement of mutual respect allows for differences of opinion
and behavior. The last two elements of community require the active role of community members.
In other words, a community only exists if members are responsible for its integrity, as well as its
well-being. In most cases, this responsibility takes the form of active participation in community
happenings. [Wood and Judikis, 2002]

Using these six elements we can define community in terms of the relationships and interac-
tions present. Defining community is necessary to determine where communities exist, but it is
also vital in telling us what creates community and what establishes expected behavior among
community members. All these factors are extremely important in evaluating “ virtual communi-
ties,” that is, determine their functionality and value in human society.

3.3 Idealized Community

Community theory, in both a psychological and sociological sense, sees community in part as
a value. As such, community is defined and forever changing based on the views and desires
of its members. [Smith, 2005] This dynamic nature of community itself forces us to reexamine
current definitions and ideas about community in the context of cultural changes. Evaluating
what have been named “virtual communities” in terms of community characteristics requires a
working, dynamic definition of community as we experience it in modern culture. We are forced
to ask what exactly community has become in modern society? How can we identify modern
communities?

As we have established, the notion of community has existed for centuries. Humans do not
live alone; they are social beings, born to unite into groups. This basic structure of groups, seen
all over the globe, has been universally called “community.” In the previous chapter, the his-

torical theory of such communities was discussed, but modern community theory also involves a different sort of analysis. The term community is applied to such a broad spectrum of circumstances in modern culture that its exact definition has become blurred. In past decades, use of the term *community* brought with it a certain nostalgia - the feeling that there has been a loss of the public sense and value of community. Its usage was often associated with the common wish of reviving the close knit support groups that somewhere and somehow had been forgotten or lost. Recently, social theorists have argued that this loss of our sense of community is due to industrialization, large-scale bureaucracies, the loss of local autonomy, and our culture of mobility, convenience, and privacy, (all of which are embodied by the development of the Internet).

There is an inherent danger in the consequences of this nostalgia. Romancing the idea of community leads to the formation of an *ideal of community*. The danger then occurs as a result of comparing current aspects of possible communities to the ideal, when the ideal itself may or may not have ever existed in human society. Many academics now argue that theories of community have led to an idealized definition of community, one that has been adopted into the public sphere of cultural beliefs. While many of the community characteristics mentioned in the previous section are valid observations of the visible aspects of social groups, we must be careful in detrimentally restricting the working definition of community to a static list of characteristics without which community cannot exist. The book *Contemporary Community: Sociological Illusion or Reality* by Jacqueline Scherer clearly presents the apparent loss of community, its subsequent somewhat foggy form in modern culture, and the dangers of constructing such ideals to modern community.

To begin, following the historical trend of social groups, Scherer believes that communities are necessary for human life. She states, "communities have always existed – and will continue to do so – because man is basically a social creature, unable to live independently. Modern communities, however, are not as visible and as clearly defined as in the past." [Scherer, 2003] It is important to understand that communities do exist, the problem arises in identifying them. The comparison of modern social groups with past notions of community leads directly to a misidentification of community elements. Community today is not the same organism it was in the past. Scherer talks about the aura that ideal community holds over many individuals. "To some it is a strong yearn-

ing to return to a pleasant, less complicated past when most people knew community through personal experiences. It suggests a personal and human kind of togetherness and is a more comfortable classification than such antiseptic term as institution and organization." [Scherer, 2003] So how does this ideal notion of community manifest itself in modern culture?

Because humans need community to exist, speculation about the loss of community may leave humans with a feeling of emptiness. The formation of an ideal of community is detrimental to social well-being. "Both confusion and discomfort stem, in part, from an idealization of the concept that has no base in empirical reality; in part, from a desire to find pleasant and positive human forms of association to replace those less satisfying; and in part, from a heavy dosage of sentimental and sloppy thinking, combined with the common habit of oversimplification." [Scherer, 2003] Idealized cultural norms of community are extremely prominent among the general public; in many cases, people describe their notion of community in idealized terms but when forced to find specific examples they flounder or turn to the common uses of the term community - mainly location and interest based. Their notion of shared experience is one of physical closeness and locality.

The loss of definitive, easily recognizable communal groups leads society to apply the term community to a broader range of social interaction. Scherer addresses this problem of identifying modern communities. She says that because "these modern social collectives are not immediately visible as physical entities, and cannot be readily located ... we require the assistance of modern social scientific tools to uncover and document what we know must exist." [Scherer, 2003] Scherer argues that the types of community that are likely to exist in modern reality has not simple entities that can be identified by simply placing adjectives in front of them. They require, instead, an outlining process - one that involves a certain degree of motion and changing processes - to which we can append ideas or themes. Scherer's concept of defining community through an outlining process provides the necessary structure of identifying modern social groups. Because of the dynamic nature of social institutions and structures it is necessary to have a malleable definition of community. As Scherer says, "as quickly as social forms are identified they change. Any process of locating modern community involves a critical investigation of many different kinds of sociability,

often far afield from traditional research areas.” [Scherer, 2003]

There is no doubt that community was changing before the advent of the Internet. [Wellman et al., 2002] It was in the 1970s that analysts began to recognize that community had moved beyond geographical restrictions. This subtle transformation was the result of cheap and efficient transportation as well as enhanced communication networks. Since the 1970s, there have been numerous studies documenting the shift from local to global community. Technology has made long-distance communication possible and people are able to maintain community without geographic limitations. After this period of recognizable changes in the structure of community people came to conceptualize community in terms of *social networks*. It is from this context, we are able to investigate what have been deemed “virtual communities.” Many theorists believe that virtual communal spaces are the modern equivalent of community. They often cite the explosion of such communal groups as a testament to their necessity and value. Others believe that virtual communities should never be considered real communities; they even think their very existence is taking away from real community and social involvement. We will consider some of this research and existing theories of virtual communities in the next chapter.

Chapter 4

Virtual Communities

4.1 Introduction

The term virtual or online community is used loosely to describe the variety of social groups interacting via the Internet. The term “virtual community” is attributed to the book (of the same title) by Howard Rheingold, published in 1993. [Rheingold, 2000] In recent years, virtual communities have attracted significant attention because of their rapid growth and efficient means of expanding social interactions; they give people the ability to interact with other individuals anywhere across the globe. Yet, even with their ability to open a whole new range of social possibilities, the recent increase in virtual community participation has bred fear and criticism. [Donath, 1999] [Smith, 1999] [Kollock and Smith, 1999]

Virtual communities depend heavily upon social interactions and exchanges between users via the Internet. The medium and technology behind the communication varies depending on the specific community - interaction may occur via email, chatrooms, message boards, instant messaging, etc. Yet all these different technologies share a common thread - they require communication to be mediated by computer technology. The prominence of virtual communities in today’s culture begs the question, can people find true community online? The explosion of such virtual communal spaces seems to imply that humans are searching to fill some void (the loss of community?) and perhaps online communities fill that emptiness. The popularity of social networking

sites, in particular, has increased exponentially within a past few years. Debates on the consequences of this Internet interaction and communication have permeated academic arenas as well as public forums. Enthusiasts and critics go back and forth about the benefits and dangers of the current direction of society – are we really moving community online? [Dreyfus, 2001] [Herman and Swiss, 2000]

4.2 The Internet Debate

There has been ample research on whether “virtual communities” are viable, sustainable communities. Can we really call them communities? Can virtual interactions, between people who have never met face-to-face (FtF), be supportive and intimate? Can virtual spaces replace face-to-face community? This debate has prompted responses from all sorts of groups. Internet enthusiasts sing the praises of the communication abilities made possible through new technologies; they maintain that the Internet has the ability to create new and wonderful communities. Critics of the Internet, on the other hand, warn that virtual communities are destroying face-to-face community. Recently, however, there has been a new effort to approach the Internet as simply *transforming* community. Unfortunately, most of the research done on the social consequences on the Internet and virtual communities promotes only one side of the debate - never considering an overlap. The Internet debate includes topics that range from issues of access, identity, privacy, political involvement and social capital. Here we focus mainly on the issues of community involvement and psychological issues of community. [Fisher et al., 2002] [Poster, 2001]

The Dystopian Perspective

Critics of Internet communication argue the cyberspace can never replace real community. In fact, they see the very existence of virtual communities as distracting from meaningful real-world communities. One argument for this belief is to consider the types of connections that people maintain via the Internet. Human interactions can be characterized in two ways: primary and secondary interactions. Primary interactions are the strong, familial bonds that people maintain in which

people know each other in multiple dimensions. Primary connections are typically maintained by frequent contact and involve broad based emotional support. Secondary interactions are weaker friendships that can include acquaintances or individuals known in a single, or few, dimensions. Many critics see virtual communities as promoting secondary interactions, while at the same time taking away from primary connections. "What might appear as *online communities* are really people who share some (usually single) category, such as a special interest or an easily generalized identity, and are not people bound across multiple activities or social differences." [Katz and Rice, 2002] Online interactions are considered superficial, fleeting and impersonal. In addition to promoting weak, unfulfilling interactions, many Internet critics, including well known author Robert Putnam, claim that Internet use and participation in virtual groups detracts from social capital. In his book, *Bowling Alone*, Putnam attempts to show that communities fall apart without social capital - which he defines as informal and voluntary association, communication and social interaction. Another Internet paradox is that virtual communities are relatively heterogeneous, whereas face-to-face (FtF) communities are typically quite homogeneous. [Putnam, 2000] Many people consider diversity as a beneficial element of community. Social theorists, on the other hand, say this homogeneity is a positive aspect of FtF community. A "[face-to-face] community has a better chance of building and maintaining its [own] culture and identity." [Katz and Rice, 2002] But can virtual spaces build a sense of belonging and mutual responsibility enough to ensure their own survival? Community members need to experience a sense of commitment and identification. The balance of strong and weak bonds among people has been disrupted by the uneven promotion of each on the Internet. Critics believe this new balance, heavily weighted toward weak links, is emotionally unhealthy.

The Utopian Perspective

Proponents of the Internet point to its ability to build and maintain community without regard for geographical boundaries. The global diversity of the Net is expressed in the numerous communication modes and informational resources available. The Internet also provides a vital link to a greater network for many small communities. In this way, Internet communities supplement

physical communities. In many cases, the Internet allows communities to be part of an extensive informational resource - a vital aspect of dynamic communities and communication. The Utopian argument advocates that virtual communities can be supportive and nurturing. They say that the weak (secondary) ties that online communities enable "may provide better and different kinds of resources than strong, familial bonds."Katz and Rice [2002] In instances where individuals cannot find FtF communities to support their needs, they turn to online interactions and find a whole new range of interaction and support possibilities. In addressing the balance of strong and weak ties maintained through virtual communities, Internet supporters argue that the variety of interactions made possible allows for both types of bonds to be developed, yet they rarely speak to the proportion of such ties. The interface of the Web often encourages users to share personal information more quickly than in real life. This ease of information sharing is an interesting consequence of the anonymous nature of Internet communication. The quick exchange of information allows users to become more intimately connected to others more rapidly than in real life. Another one of the most highly promoted benefits of the Internet is its potential to create shared information and allow for minority voices to be expressed. Many proponents believe the Internet has great potential in political and social activism.

4.3 Investigating Virtual Spaces

Whether deemed beneficial or detrimental, virtual spaces on the Internet have flourished. They appeal to all demographics and seem to attract increasing membership. To understand the functionality and dominant linguistic classification of these groups as communities, virtual spaces need to be evaluated both quantitatively and qualitatively. Academic interest in virtual communities has grown tremendously in the past decade. [Hampton and Wellman, 2003] In their article *Net Surfers Don't Ride Alone: Virtual Communities as Communities*, Barry Wellman and Milena Gulia summarize the state of virtual community research and argue that virtual communities *are* real communities. Wellman and Gulia recognize that, unfortunately, there is a lack of ethnographic research on virtual communities, no surveys on the connections that actually exist among people, and no information on the allocation of time spent on the Internet. As they explore virtual com-

munity research Wellman and Gulia frame their investigation around a series of questions. We will present a few in detail here:

1. Are relationships on the Net narrow and specialized or are they broadly based?
2. How does the Net affect people's ability to sustain weaker, less intimate relationships and to develop new relationships? In what ways are these weak ties useful?
3. Are virtual communities like "real-life" communities?

Q1: Are relationships on the Net narrow and specialized or are they broadly based?

"The standard pastoralist ideal of in-person, village-like community has depicted each community member as providing a broad range of support to all others." [Wellmna and Gulia, 1999] In this ideal situation the community itself is a highly interconnected web with only a few outside connections. It is not clear whether such broad support ever existed in Western society; in fact, research by Wellman and Gulia indicates that with the exception of kin and small friend clusters, the majority of an individual's friends do *not* know each other. Because of this ambiguous need for broad based support networks, the answer to this question involves a few conditional considerations. Social spaces on the Internet are most often targeted at specific groups. But this narrow focus of single groups does not limit global participation - on the Internet you can find a interest group for anything imaginable. The trend of Internet communities seems to follow the theory of multiple communities (that was explored in previous chapters). Internet users may explore multiple facets of their identity within individually targeted online groups. It is important to point out that many of these extremely narrow based groups evolve around information exchange rather than emotional support. If the Internet was solely used for this means then the vast majority of virtual social groups would be characterized by narrow, specialized relationships, but the Internet is also used for other purposes. Many Net users are looking for more than just information - they seek emotional support, companionship and a sense of belonging. (Because they are missing it in real life?) Anecdotes seem to say that this sort of support is possible and effective via the Internet. These supportive online communities tend to be characterized by active participation and communication among members. But while they have the potential to direct further investigation, anecdotes cannot give a full picture. More research needs to be done on this type of Internet

community. For now we need to ask why people turn to the Internet for this type of social interaction? While we might not have time to explore this question fully here, it is relevant to keep in mind. People approach online relationships from very different backgrounds - they seek different rewards. The Internet has been shown to support both narrow and broad based interactions, depending on the desire of participants.

Q2: How does the Net affect people's ability to sustain weaker, less intimate, relationships and to develop new relationships? In what ways are these weak ties useful?

Wellman and Gulia propose that the Internet may differ greatly from real-life community in its ability to foster and maintain large numbers of weak relationships. The lack of preexisting social stereotypes and situational cues might also encourage formation and maintenance of these weak ties. There is ample evidence of the usefulness of these weak connections in social science research. Weak ties are more effective than strong ones in linking people of different social backgrounds, maintaining contact with different social circles, and perhaps most importantly, opening a wealth of information and opportunity. For example, utilizing weak relationships or friends of friends is much more effective in finding a job than using tight-knit community relationships where everyone is more likely to only know what's available within that community itself. Weak ties on the Internet can be maintained without significant effort on the users part. This efficiency allows people to maintain more relationships than would be possible solely through FtF interaction. But how does the increase in weak connections affect strong bonds? The long term consequences of maintaining an abnormally disproportionate number of weak relationships has not yet been investigated. We will examine bit at the specifics of this changing relationship balance in following chapters.

The sheer number of people on the Internet opens a huge potential resource for people looking to build new friendships. There is debate, however, about whether relationships built online can be supportive and intimate. Friendship most often involves reciprocity. Many social scientists believe that the physical distance between support seekers on the Internet makes the incentive for reciprocity less. Nevertheless, virtual community members do provide support, even through weak ties. As mentioned previously many users even tend to share deeply personal information

with greater ease over the Net. Mutual group attachment helps to define these social groups and thus community attachment is intrinsically tied to reciprocity. "Net members are distinctive in providing information, support, companionship and a sense of belonging to persons they hardly know off-lone or who are total strangers." Wellmna and Gulia [1999] Evidence points to the ability of the Internet and virtual communities to foster an environment in which people can build new relationships and maintain existing connections. These features of online communities indicate that perhaps community does exist in virtual spaces. It is important to keep in mind, however, that it is only a small subset of the total number of virtual spaces in existence that actually provide a user interface and medium for such supportive bonds and potential friendships.

Q3: Are virtual communities like "real-life" communities?

Wellman and Gulia argue that the Net successfully maintains strong, supportive community ties, and it may be increasing the number and diversity of weak ties. They importantly point out that these online relationships are based not on shared social characteristics, but instead shared interests. The specialized nature of online ties allows for membership in multiple virtual communities - the aggregate of which provides a broad range of support. Because of this specialized structure, virtual communities tend to be homogeneous in interest or attitude but diverse in age, gender, socio-economic status, and ethnicity. Virtual communities incorporate many of the characteristics used to identify communities, but they also differ in certain important respects.

1. Virtual community members differ in their acknowledgment of interconnectedness. Virtual communities have a broad spectrum of participation levels. Some member are actively engaged in community interaction while others simply lurk and offer not active participation.
2. The architecture of the Internet encourages significant alterations of the underlying structure of communities. The balance of strong and weak links maintained through virtual communities differs greatly from FtF community.

The first of these inquiries begins to elucidate the question of why some people and not others look to virtual spaces to find a sense of community. The variation in community participation and involvement points to differing consequences and perceptions of Internet use for different sectors of the population. The need for communal interactions push some more than others to search for community on the Net. The second question is perhaps the more interesting of the two from a

mathematical perspective. “Whether social uses of the Internet have positive or negative effects may depend on the balance of strong and weak network ties that people maintain.” [Kraut et al., 1998] There are many different approaches to explaining the presence of strong and weak ties in a social network. This idea will be explored more in the upcoming chapters. While many social theorists have now acknowledged that real community may very well exist on the Internet, they are also forced to recognize the changing network structure of these new communities. The consequences of this structural alteration may have long term consequences that are more difficult to predict. The changes in community structure can be analyzed through statistical and mathematical analysis. But, before examining specific community arrangements and organization, we explore the new notion of conceptualizing community that has developed around social networks. This new characterization allows for an intuitive and numerical analysis of community structure.

4.4 Virtual Social Networks

In most Western societies community has been traditionally viewed as a common locale; consisting of neighborhood interactions and social cohesion. In recent years, the geographical restriction on community has been removed by the host of communication technology now available. Technology and innovation have allowed for the expansion of community to include not only locally based connections, but also a wide range of globally based interaction. As a result of this changing structure of human connections, there has been a recent trend in community studies to search for different methods for identifying communal groups. Communities are now often thought about through the vocabulary of *social networks*. Social networks allow communities consisting of a mixture of local and global interactions to be modeled intuitively; they have become a new means of thinking about definitions of community and social theory. Social networks have become a “buzz word” in modern society - they are often seen as one of the most significant aspects of modern community theory. [Lee and Newby, 1983] Mathematical theories of networks have become a method for identifying modern community. The notion of social networks applies specifically to virtual spaces because of the ease and overlap in language and ideas. Virtual community members often take for granted that the computer networks over which they interact are also social

networks.

Social networks can be easily understood by visualizing a web of connections among a group of individuals. Consider the following example, shown in Figure 4.1. This is a basic example of a social network; it is a representation of high school students. Each of the dots represents a male or female student – blue for boys and pink for girls. The links between them are determined by dating relationships at the high school; that is, two individuals are linked if they have been or are in a romantic relationship.

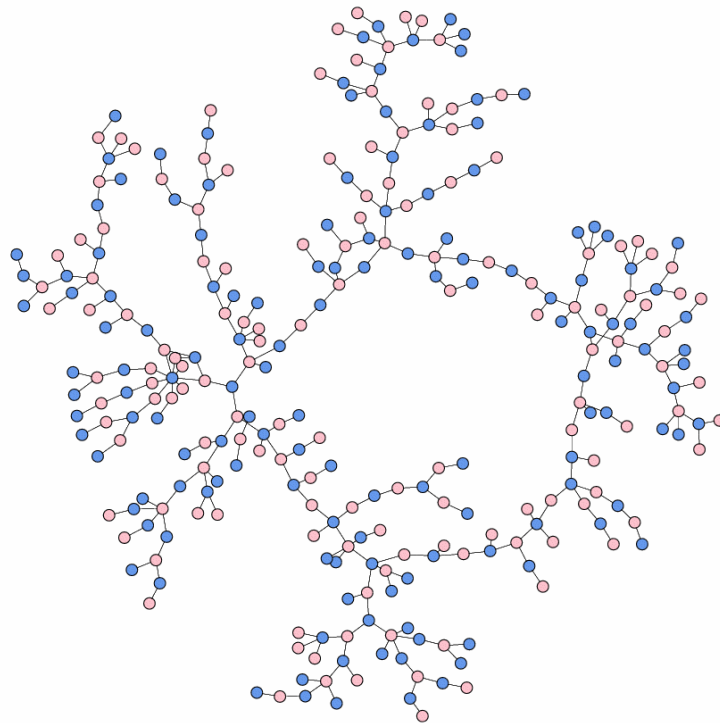


Figure 4.1: High school dating social network: Image by Mark Newman

It has been argued that the immediate social environment of urban families is best considered, not as the local area in which they live, but rather as the network of actual social relationships they maintain, regardless of whether these are confined to the local area or run beyond its boundaries. [Smith, 2005] [Bott, 1957] Modern society lacks the geographic social cohesions that is easily recognized as community. The intuition of social networks allows for the new characterization of modern communal groups. It is a dynamic definition that allows for multiple facets and many

different types of social interaction. Social networks are currently one of the most commonly cited definitions of community among researchers and social scientists. Yet, even through many people intuitively see networks in all aspects of their social interactions, they see community in the more ideal sense. Rationalizing both these forms of social groups presents a problem for many people.

Virtual communities, more than other types of communal groups, lend themselves to the vocabulary of social networks. Computer networks are the foundation of virtual spaces. Computer systems were thought of as networks before the concept of networks was ever applied to social interactions. Thus, the transition from computer networks to virtual social networks flows easily. The characterization of community as an individual's social network is not only a convenient, intuitive visualization, but it is also a valuable computational tool for investigating the nature of present day community as we will see in the next chapter. The recent field of social network theory and analysis deals specifically with graphical representations of social networks. Social network theory views social relationships in terms of *nodes* and *links*. Each node is an individual or actor within the network. Each link between nodes is a relationship between two individuals. Thus, when an individual's community is considered a web of interactions, or a network, it can be mathematically mapped and analyzed.

Chapter 5

Mapping Social Networks

5.1 Introduction

The theory of networks is grounded in the mathematical theory of random graphs, which began in the late 1950s with Erdős and Rényi. Random graphs are used to generate systems of nodes and edges to model natural networks. Social networks in particular are one of the most intriguing naturally occurring networks because of the unique properties they display. In the late twentieth century, the notion of six degrees of separation, meaning that any two people in the world can be connected by a relatively short chain of people, brought about the notion of a *small-world network*. [Durrett, 2006] In 1998, Duncan Watts and Steve Strogatz presented a mathematical explanation for the mystery of what we call the small-world. [Watts and Strogatz, 1998] Their ideas caused a revolution in the way scientists thought about the theory of networks. [Buchanan, 2002] Though we will refrain from formally defining graph theories in this paper, a graph can be thought of as a set of vertices (representing people in a social network) and a set of edges on the vertices (representing friendships or interactions).

The history of Watts and Strogatz's groundbreaking discovery began with two important ideas about social networks. In the mid-1960s psychologist Stanley Milgram performed his famous small-world experiments, trying to build a picture of the web of interactions that link people into a community or network. Milgram's work revealed the surprising result that any two people can

be linked together by a relative small number of intermediate connections; Milgram's estimate was around six, hence the common phrase *six degrees of separation* among people. Milgram's work fascinated sociologist Mark Granovetter, who began to examine the strength of social ties. He published his ideas on what he deemed the *strength of weak ties*. Granovetter's insight revealed that without weak ties a community would be fragmented into a number of different isolated cliques. Granovetter's weak links built bridges between community groups; they were necessary for connected social networks. These two principles of social networks make them unique - they are somewhat self-organized and locally dense. Some 30 years later when Watts and Strogatz published their work, they were able to connect Milgram and Granovetter's ideas and offer the world a new mathematical explanation of the structure of the complex natural networks that lie between order and chaos. [Barabási, 2003] Watts and Strogatz provided an explanation for the network architecture incorporating both local and global characteristics and gave a new insight into the sociology of community.

5.2 Mathematical Measures of Network Structure

In their seminal paper in *Nature* in 1998, Watts and Strogatz introduced a simple (static) model of a social network. [Watts and Strogatz, 1998] Their model provides the foundation for most of the subsequent research done in this area. Watts and Strogatz recognized that social networks could be thought of as a combination of random and ordered graphs. Intuitively this makes sense, social networks can be thought of as a combination of global and local connections. Social networks typically have a strong centralized group of local connections. These connections may include family, neighbors, and/or close friends. Social networks also include a wide range of global or weak connections that may appear somewhat random. Combining these two notions of local and global structure, Watts and Strogatz formulated a network model by beginning with a completely ordered structure, a lattice for example, and introducing a degree of randomness into the graph by "rewiring" some of the edges in the ordered graph. As seen in Figure 5.1 the combination of regular and random connections results in a small-world network.

Social networks are considered small-world graphs because they intuitively incorporate a

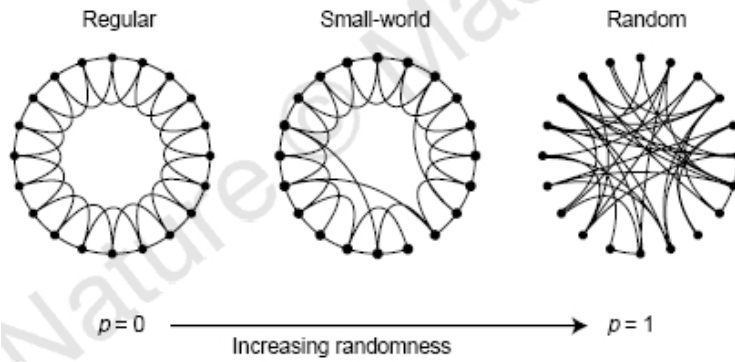


Figure 5.1: Watts Strogatz small-world network of Canada [2006]

strong local community and a weak global community. Once a social network can be characterized in terms of mathematical structures, we can perform various graph theory measures on the network. This field of study is known as social network analysis. “Social network analysis provides a conceptual means for thinking about the social world...the methods of social network analysis provide formal statements about social properties and processes.” [Wasserman and Faust, 1994] The field of social networks analysis is a rigorous and extensive subject, but even without many of the mathematical tools necessary for in depth analysis, it is still possible to look at some very basic measures that are important to network analysis.

Social network analysis uses many different measures of connectivity, closeness, and other graphical statistics to reveal network structure. The common statistics used in identifying small-world networks, that are relatively easy to compute, are *average distances*, and *clustering coefficients*. We will also look at the *average degree* of each vertex and briefly at degree distributions. By exploring these three properties of virtual social networks, we can speculate on the social consequences of network formation and growth. To begin, we must consider some basic mathematical definitions. Networks can be modeled using mathematical graphs, which are a very intuitive logical structure. A graph is made of a set of distinct nodes and the connections between them, called the set of edges of the graph. From this perspective, many different objects can be considered graphs. Formally we define a graph to be,

Definition A **graph** G is a pair of sets (V, E) , where V is a nonempty (finite) set called the set of

vertices of G , and E is a (possibly empty) set of unordered pairs of distinct elements of V . E is called the set of *edges* of G .

For example, Figure 5.2 is one example of a graph with vertex set $\{v_1, v_2, v_3, v_4\}$ and edge set $\{v_1v_2, v_1v_3, v_1v_4, v_2v_3, v_2v_4, v_3v_4\}$.

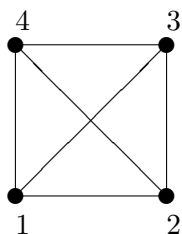


Figure 5.2: Simple graph on four vertices

A graph is the basis of network theory because it not only allows for a natural visualization of a network, but it allows known graphical theories and analysis can be applied to real world networks. Graph theory provides a powerful method for analyzing the structure of social networks and understanding the architecture of the network gives an additional perspective on community formation and structure. One of the most important concepts of social network analysis analyzes the different properties that depend on the number of connections of each node in the network. To do this, we define a node *degree*.

Definition The **degree** of a vertex v is the number of edges connected to v . For example in Figure 5.2 the degree of vertex v_1 is 3.

Node (vertex) degrees are very important in revealing network structure - specifically we want to find the average degree of each node in the network and the distribution of all of node degrees. In my analysis of friendship networks, I will compare data generally with two different types of degree distributions, seen in Figure 5.3. In this figure, the horizontal axis represents the range of vertex degrees in the network while the vertical axis gives the number of vertices in the network with a certain degree. That is, a point (x, y) says that there are y vertices in the graph with degree of value x .

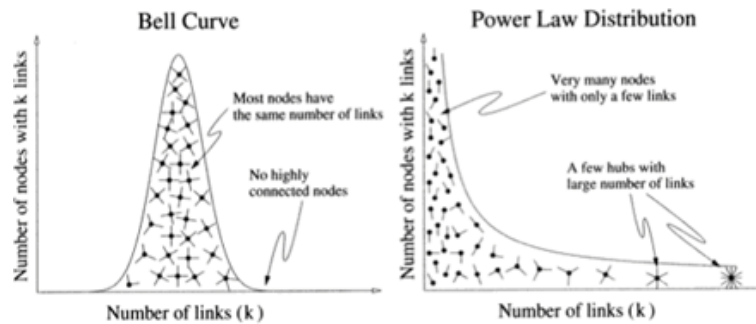


Figure 5.3: Potential degree distributions

These distributions may seem familiar; the left figure shows a normal distribution and the right shows a power law distribution. Both of these distributions occurs in real world networks. As it turns out, the networks can be characterized according to their distributions because differing degree distributions result from different mechanisms of network formation. These mathematical properties can then be translated into sociological ideas. To begin, consider what each distribution implies about the structure of the social network it characterizes.

Normal Degree Distribution

A normal degree distribution implies that each vertex in the network has on average the same degree. That is, the range of vertex degree is symmetric around the mean - in most cases the majority of the vertices in the graph have a degree close to the average. This type of distribution comes as a consequence of each edge being included in the network with a constant probability. That is, if each edge has the same probability of being in the network, we would expect each vertex to have the same degree. If we consider this from the perspective of social networks, this would mean that each person has about the same number of friends. It would then imply that any two people in the networks are equally likely to be friends - any connection has an equal probability of existing. This may seem contrary to the idea that most people meet other through existing friends, but because of the nature of human interaction it turns out that in most friendship networks people maintain around the same number of friends.

Power Law Degree Distribution

A power law degree distribution differs significantly from a normal distribution. As seen in Figure 5.3 a power law degree distribution implies that the majority of nodes in the network have a relatively small degree, while there are just a few nodes that have a very large degree. That is, the networks is characterized by what are called “hubs” - nodes that are connected to a large portion of the network. A power law degree distribution comes as a consequence of a network growth where each edge has a differing probability of inclusion in the network. In particular, it is a consequence of a preferential attachment growth model. That is, as nodes join the network they are more likely to “want” to be connected to existing nodes with high degrees. This might make sense in terms of social networks that have some economic basis, in that being connected to the most popular node has certain advantages, for instance in terms of the efficient spread of information or accessibility. It may also apply to friendship networks - people want to become friends with the most “popular” people in the network.

Degree distributions reveal global network structure. By comparing degree distributions we can argue that the network was built off certain assumptions or properties. We can consider the different models of network formation that may lead to the observed degree distribution. The average degree of nodes in the friendship network gives an approximation for how many friends the network allows a certain person to maintain. This is particularly important for considering the proportion of strong and weak ties within the network. Another network measure also related to the node degrees is that idea of distances within the network. Network distances calculate the length of paths from one node to another along edges in the network.

Measure of Distance

Average distance between nodes within a network gives an empirical measure of separation. That is, we can ask what is the length of the maximum path from one node to another? This property of networks reflects Milgram’s idea of “six degrees of separation.” Social networks are interesting because their construction, that is, the combination of strong and weak ties allows for small average distances between nodes. While investigating virtual social networks we want to con-

sider the separation of nodes. Intuitively, the increase in the number of weak ties should lead to a decrease in the average distance between nodes. Calculating distances within a network is done using computer algorithms. It is important to consider these global properties, but we must also consider a measure of local network structure.

Clustering

The local characteristics of a given network are most often analyzed in terms of clustering measures. Local clustering in a graph is measured by the *clustering coefficient*. This idea was first introduced by Watts and Strogatz in 1998 in an article in *Nature*. We define the clustering coefficient as follows,

Definition The **clustering coefficient**, C_{v_i} , of a vertex v_i (where $\deg(v_i) > 0$) is the proportion of links that exist between the vertices within its neighborhood divided by the number of links that could possibly exist between them.

Example This idea is best seen through a simple example. Consider the series of graphs shown in Figures 5.4 and 5.5. Suppose we want to find the clustering coefficient of v_1 in the original graph, Figure 5.4a.

To begin, we consider each of the possible connections between the neighbors of v_1 , shown in red in Figure 5.4b. It is clear that the neighborhood of v_1 is the set $\{v_2, v_3, v_4\}$. Using this, we can calculate C_{v_1} for each graph.

C_{v_1} in the original graph is zero, since no secondary connections exist among the neighbors of v_1 . The vertex v_1 is essentially unclustered.

In the two graphs in Figure 5.5, however, some of the potential edges do exist. Therefore, the clustering coefficient increases. In the graph in Figure 5.5a there is a edge between v_2 and v_3 . So, out of the possible 3 edges 1 exists. Thus, in this case the clustering coefficient of v_1 is,

$$C_{v_1} = \frac{1}{3}$$

In the graph in Figure 5.5b, all of the possible connections among the neighbors of v_1 exist. So, the vertex is fully clustered, that is

$$C_{v_1} = 1$$

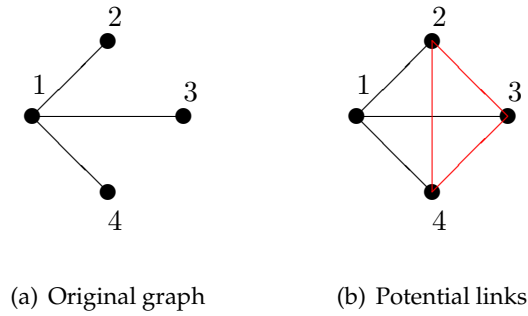


Figure 5.4: Original unclustered graph and potential links

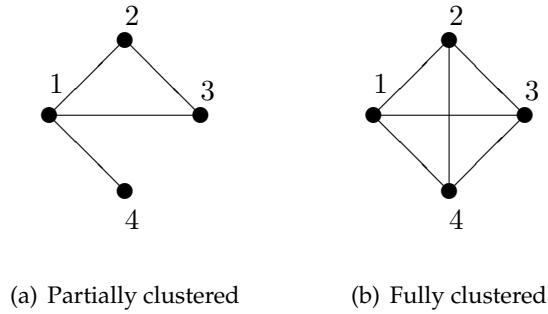


Figure 5.5: Partially and fully clustered versions of original graph

The clustering coefficient on its own measures clustering around a certain vertex, but we would also like to measure the clustering of the network as a whole. The global clustering coefficient is defined rather intuitively as the average clustering coefficient of the vertices in G .

Definition The **global clustering coefficient** of a random graph G is

$$C = \frac{1}{n} \sum_{i=1}^n C_{v_i}$$

where n is the total number of nodes in the graph and C_{v_i} is the clustering coefficient of vertex $v_i \in V$.

The global clustering coefficient of a network measure the connectedness of the communities within that network. It reflects the extent to which friends of a certain actor within the network are also friends with each other. Thus, the global clustering coefficient measures the cliquishness of a typical friendship circle. [Watts and Strogatz, 1998]

In the following chapters we will apply these mathematical network measures to a virtual social network in hopes of revealing its underlying structure. We want analyze the mathematical structure of the network to see what it implies about the social mechanisms of network formation and current growth in comparison to FtF networks. This understanding will give further insight into usage patterns and its influence on ideas of community.

5.3 Consequences of Network Analysis

Mathematical network analysis is an extremely powerful tool, but we must be careful is applying these statistical measures to actual communities. The transition from community to social network follows quite logically because of the nature of communal interactions and maintenance of friendships. In this way, we expect social network analysis to have consequences for community theory and sociological ideas of friendship. But just because communities can be thought of in the language of social networks does not mean the two entities function similarly. Applying the analysis of networks to real communities has many potential benefits but it also carries with it a certain danger. As much as we would like to believe that analytical measures can expose patterns in human behavior, the actions of human beings are much more complicated than simple numbers. If we combine mathematical measures with ethnographic and anthropological research, however, we gain a more complete picture of behavior and community that would not be possible using each method individually.

It is interesting to consider social networks as modern manifestations of community because of their widespread applicability to all natural patterns. The self organization of many networks

is common to everything from food webs to neural networks to protein interaction. To a certain degree, networks analysis can offer new approaches to understanding natural phenomena and behavior. In the specific case of friendship networks, mathematics can advise sociological and anthropological research, but we must be careful to prevent numerical measure from dictating social patterns. For example there are various methods for identifying the most “robust” node in the network. In mathematics this might correspond to the node whose presence is vital to network connectivity - that is, if we remove that node the network becomes the most fragmented or disconnected. If we apply this to social networks, specifically friendship networks, we might be able to determine “popularity” of members. But is the really an accurate measure of popularity?

The tools of mathematics are often taken as “proof” of scientific discovery. One of the goals of the field of science, technology and society tries to educate the scientific community about the danger of claiming unbiased, logical knowledge production. Scientific knowledge is created by humans. Therefore, it can never be truly without human opinion and influence. It is necessary to condition pure empirical accounts of human behavior - because of this, my research provides not only a quantitative approach but a qualitative one as well.

Chapter 6

Case Study: Facebook.com

6.1 Introduction

Social networking via the Internet has become extremely popular in the past few years. The Internet hosts hundreds of “sites,” organized by age group, special interest, and even location. These sites appeal to users in a variety of ways - some offer emotional support, other provide access to specific demographics around the world, for instance, personal ad sites are extremely popular. Most importantly, they encourage social interaction and information sharing. The structure and interface of a site dictate its functionality and appeal - message boards encourage conversation, while photo sharing sites promote the spread of media.

Many of these sites display the identifiable characteristics of community discussed in previous chapters. Online spaces have been shown to offer broad based emotional support and a sense of belonging and community involvement. Yet for some there is a tendency for many users to deny that these spaces constitute communities - they see social networks as tools rather than communal spaces. So where does this disconnect come from? What distinguishes a community from a social network? I will investigate this question in the following chapter, based on the uses and perceptions of a social networking website in a small college community.

6.2 Facebook.com ©

Designed by three Harvard sophomores in February of 2004 as an online directory to connect Harvard students through online social networks, Facebook.com has become one of the most popular social networking sites on the Internet. Since its expansion to universities and colleges around the globe, Facebook has become part of the daily routine of thousands of college students, high school students and recent graduates. The Facebook phenomena opened the door to a variety of social networking sites because its success and rapid expansion signified the demand of a new market. Facebook's rapid success enabled the creators, Mark Zuckerberg, Chris Hughes, and Dustin Moskovitz left Harvard to start a 10-person company out of Palo Alto, California.

Facebook has become "so ubiquitous among college students that they tell others to *facebook* them to look them up on the site. Browsing it is known simply as *facebooking*." [Press, 2005]. Facebook users create an online profile of themselves, including information ranging from basic biographical data to hobbies and interests. Users can also post pictures and write notes that are displayed on their profile. Each user builds a friend network by joining preexisting geographical networks or by adding and explicitly confirming other users as their "friend". Individualized privacy controls allow users to choose who can see their profile - ranging from friends only to all users. The site also allows users to join interest groups that have been formed by existing users.

Facebook allows for two forms of communication. Users can send individual private messages to each other and they can post public messages on another users' wall. Walls form a publicly visible, but individually targeted, bulletin board. It is important to note that both these types of communication are asynchronous. Facebook does not incorporate a synchronous discussion forum.

Recently new features and tools have been developed in response to user demand and suggestions. One controversial new feature, the news feed, gathers a list of recent changes among a user's friends and displays them on that user's homepage. Although this information was already visible to the user, many Facebook users considered this feature an encroachment on their privacy. Outcry and protest from users forced Facebook developers to amend privacy setting and many users quit the site altogether. Another new feature includes virtual gifts that can be given

to other users in the form of icons. (The program is a fundraiser and gifts after the initial one cost users a dollar.) In addition, Facebook was recently opened to all users. The presence of Facebook on college campuses is undeniable and its success of this social networking site makes it an interesting artifact to study.

6.3 Research Methods

Students at Pomona College were recruited to participate in this research in multiple ways. For the ethnographic research students responded to inquiries placed in the school-wide email announcements and notes placed on Facebook itself. Six students agreed to be interviewed about their Facebook practices. Participants were not compensated for their participation. Interviews typically lasted around 30 minutes but some lasted more than an hour. Research was targeted at undergraduates, with the exception of one recent graduate.

The range of participants varied based on age, gender and online habits. As part of the interview, participants were asked about their use and opinions of Facebook. They were encouraged to share experiences and stories. Participants were also asked about the nature of community itself and their beliefs about the value of community. They were asked to share opinions of virtual communities, specifically Facebook. The nature of the interviews was casual and participants seemed to feel comfortable sharing personal stories and habits. While their openness was encouraged and observed, it should be noted that this research may lack information about certain Facebook practices as a result of participants feeling uncomfortable sharing personal habits about activities labeled as taboo. Facebook breeds a certain kind of information stalking and flirtation among users. The anecdotes from these individual Facebook users serve to illustrate the mathematical and statistical network data from this study.

Friendship network data was collected from undergraduate students after they responded to an email inviting them to participate in senior thesis research on Facebook. Out of the 50 people emailed, eleven students allowed their network data to be collected. Data was collected using FazeBooka, a Java-based utility for exporting social network data from the user's Facebook account to a text file. The program requires users to log into their Facebook account and authorize

the program's access to the information available through the Facebook developers platform. Data gathered includes age, sex, school, etc. and most importantly the node and edge lists for an individual's social network. Mathematical data was analyzed using Matlab ®, a MathWorks software package.

6.4 Small College Communities

It is important to consider the specific context of Facebook usage and the background of students participating in this research to correctly interpret the research results and draw appropriate conclusions. In contrast to much of the previous research on Facebook use, which typically occurs at large universities [Ellison et al., 2006], this study investigates the impact of virtual social networking at a small college. I suggest that the impact of virtual communities in locations with a preexisting, strongly supported sense of community differs greatly from their presence in urban settings.

Pomona College is a small, liberal arts college located in Claremont in Southern California. Its campus is a distinct entity, carefully delineated and separate from the rest of the city in which it is located. Pomona College is a member of a five college consortium. The set of five campuses creates an isolated physical locale. Each of the colleges prides itself on encouraging a strong sense of community and commitment among its students. In describing life on campus the college's website states, "There's a strong sense of community, with more than 95 percent of students living on campus. The residential nature of Pomona's campus allows students to share their talents, develop new ones and benefit from the diverse social and intellectual backgrounds of their classmates and faculty." [College, 2007] The college community is built around its geographical closeness. With a student body of only 1500, students walking around campus regularly see friends and familiar faces. The community builds a strong network of interconnected face-to-face interactions and broad based support. It was in this context that Facebook was introduced in November, 2004. The rapid growth of Facebook in this small local community raises questions about the strength of existing community interactions. Was the FtF social network simply rebuilt online? Does the online community really replicated a FtF friendship community? How do students view their use of such

virtual spaces? Does Facebook expand weak, superficial connections or does it help reinforce and strengthen preexisting connections? These questions and more will be considered throughout the following sections.

6.5 Facebook Friendship Networks

Here, I will explore the mathematical structure of Facebook friendship networks represented by certain graphical statistics. Recall, as mentioned in previous sections, Facebook friendship network data for this research was collected from eleven undergraduate students at Pomona College. Although the sample size I am using is small, the results give a useful comparison for investigating virtual spaces. Using this network data, I will investigate the size of friendship networks. I suggest that this information will tell me something about the ability of the social networking utility to increase the number of weak connections that an individual can maintain. From here, I look briefly at the degree distributions of the networks. The resemblance to known network distributions suggests mechanisms of network growth - for instance, a power law distribution could potentially be a consequence of a preferential attachment growth model. Next, I look at distance between nodes in the networks. This measure is commonly understood by the popular idea of "six degree of separation." I want to estimate how "separated" these networks are compared to FtF networks. Finally, I will look at the clustering of Facebook friendship networks. Perhaps one of the most interesting statistics I will consider, clustering gives a measure of the interconnectedness of the network.

To begin exploring the architecture of Facebook friendship networks I want to consider the observed degree statistics of each network. One of the most interesting statistics extracted from this information is the mean number of nodes in each network. Examining the size of a network allows me to speculate on the nature of its existing connections - are they mostly weak or strong links? On average, participants in this research have 150.9 friends. With a standard deviation of 42.7, almost all of participants fall within the 100-200 friend range. This is a revealing statistics: it is significantly higher than the number we would expect in FtF social networks (which have been estimated at around 150). The Facebook friendship network represents just one community where

individuals have membership; it constitutes only a fraction of their social network, nevertheless, we see high numbers of friendships maintained. This statistics points to the increase in weak links in the social network; it makes sense that more weak links are maintained when the cost of doing so is almost zero. It also suggests that Facebook itself inspires a new use of the term “friend” - a much looser definition. The implications of this high number of friendships maintain we be discussed in the following sections in conjunction with ethnographic research on Facebook use.

Next, consider selected degree distributions seen in Figure 6.1. Each subfigure represents the degree distribution on one individual Facebook friendship network. The horizontal axis represents the node degree, and the vertical the number of nodes with a certain degree. In each of the figures, the one node with a significantly higher degree represents the network owner - the node connected to all others. Each distribution is roughly approximated by a normal distribution rather than a power law. Classifying the approximate distribution makes it possible to speculate on the structure of the network growth. In this case an approximate normal distribution implies that the number of friends people are able to maintain is symmetric around some mean value. This makes sense intuitively, we expect most people to have around the same number of friends and differences about this mean to be symmetric. There seems to be a maximum friend level which once reached results in a drop in the number of new friendships - that is, only a few people have more than 200 friends. The distributions in Figure 6.1 are a random sampling of the entire data set.

Next, consider the distance between two nodes in the graph. This graphical statistic is representative of the idea of “six degrees of separation.” The idea predicts that any two people in the world can be connected through six other people. In mathematics, the idea of getting from one node to another through existing connections constitutes forming a path from one vertex to the other. The distance between two nodes is then defined as the shortest path between the two nodes. That is, the length of the path with the fewest edges. Specifically, I look at the easiest measure of distance, which is called *eccentricity*. The eccentricity of a node is the length of the longest path between that node and any other node in the network. Thus, the eccentricity gives the maximum “separation” of the network.

In the case of friendship networks, distances are an interesting statistic - they give another

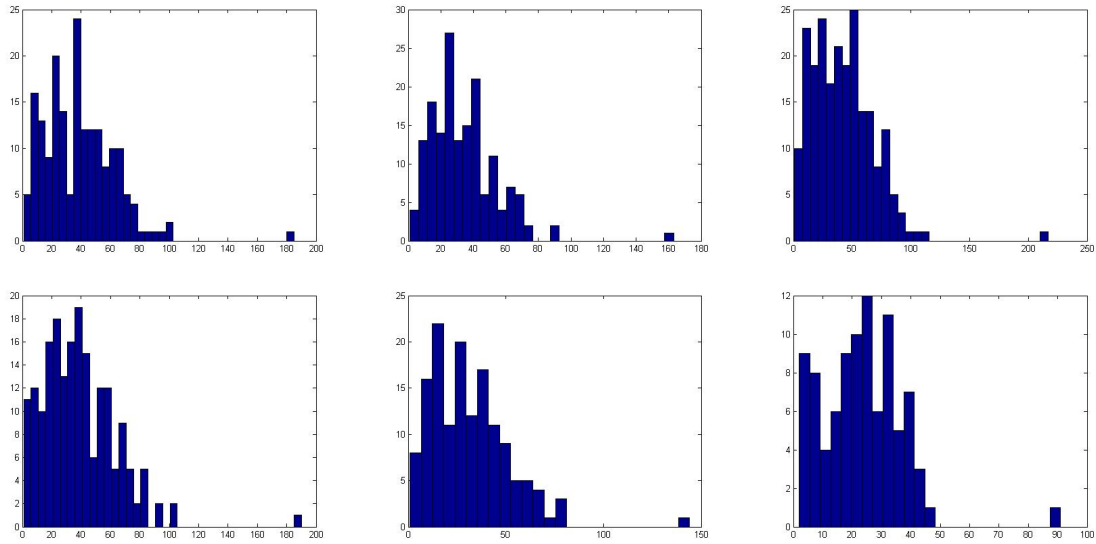


Figure 6.1: Facebook friendship network degree distributions

measure of how the network is interconnected. Because of the nature of our Facebook friendship network data, calculating the shortest path between any two vertices is relatively easy and not a very revealing statistic. Each Facebook network belongs to a certain individual - that individual is connected to everyone in the network and thus, they act as a “hub” for the network. In all cases, the maximum path length is 2. To avoid this consequence of the data itself, I calculate the maximum path between individuals in the network when I exclude the node corresponding to the network owner. That is, after removing all the connections involving the network owner. This can be done relatively easily and the average maximum distance between nodes becomes 3.3. That is, I can construct a path from any node in the network to any other node of length 3.3 or less. Essentially, Facebook networks have “three degrees of separation.” This path length is much smaller than would be expected if FtF networks; it points to the interconnectedness of the network as a whole.

The last graphical statistic considered here measures clustering in each of the friendship networks. Recall, local clustering is measured by the clustering coefficient introduced by Watts and Strogatz. Clustering is one of the most interesting measures of a friendship network because it deals specifically with the connections among neighbors of an individual node. The clustering co-

efficients of all eleven friendship networks are seen in the table below. The clustering seems to be fairly constant across different size networks, with an average of .5340 and a standard deviation of only .04. Clustering coefficients are compared to random graphs on a vertex set of the same size as the network under consideration. This comparison reveals whether a network can be considered a small-world network - which is expected of social networks. Constructing a random graph on a set of 150 vertices would yield an average clustering coefficient of around .2690. These Facebook clustering values are significantly higher than those in normal random networks, implying that Facebook friendship networks are not only highly interconnected, but can also be considered small-world networks.

Clustering Coefficients

.5780	.5956	.5048	.5160	.5778	.5029	.5713	.5459	.4969	.4651	.5193
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To understand what these three network measures imply about the structure of Facebook friendship networks, it is helpful to look at visual representations of the network data. Figure 6.2, is an example of a specific friendship network - it is a visualization of one individual's Facebook network. As previously determined with statistical measures such as clustering and average distances, the network is extremely dense, that is, highly interconnected with only a few outliers. The majority of the nodes in the network are part of this highly interconnected group - most nodes have around the same number of friends. It is important to note that the representation of the network could be different - its depends on the choices of statistical operations made by the visualization software. Network visualization techniques are highly debated - what is the best way to display the network so as to reveal its communal structure? This visualization follows the common trend of arranging undirected networks, which is to use what is called a "spring layout." (The premise of this algorithm is that each edge in the graph is representative of a spring. Then the force exerted by each edge (spring) is proportional to the difference between its current length and its natural length. The lengths are then changed to obtain a well spaced layout such that the total energy in minimized.)

Using these statistical network measures as a background, I want to investigate the observed

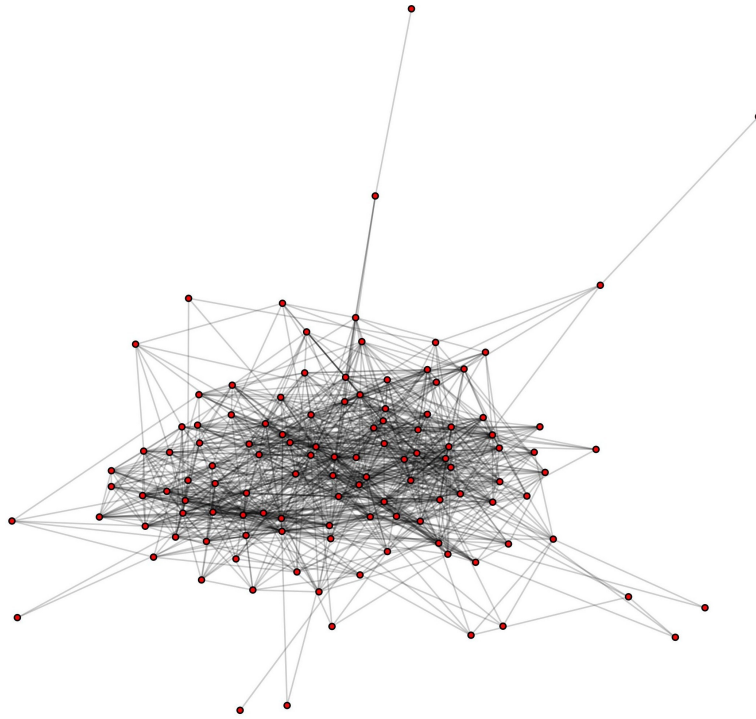


Figure 6.2: Facebook friendship network

trends of Facebook usage. The combination of this mathematical data with ethnographic anecdotes will allow us to provide a quantitative and qualitative evaluation of the impact of such virtual spaces on student notions of community and their corresponding opinions about virtual communities. Again, it is important to remember that while the network structure as represented by these statistical measures offers insight into the network, I am not claiming that the actual social network of Facebook is equivalent to this mathematical representation. Social network analysis is a valuable tool insofar as it is not equated with the actual social network where real people interact and participate.

6.6 Ethnography Results

My ethnographic research covers four broad categories of notions of community and virtual space. First, I investigate student perceptions of community; the variety of definitions and ideas of community existing among them provides a comparative framework for their understanding of vir-

tual spaces. The criteria by which students judge communities are important for discerning how they judge virtual spaces. Second, I want to explore students' specific usage patterns of Facebook. Their usage of this social networking site follows a distinct pattern of passive information sharing and lurking, perhaps revealing something about the students' notions of community itself. Thirdly, I want to understand the impact of Facebook on the preexisting FtF community. Finally, I explore how students tend to view the notion of *virtual* communities; combining usage patterns with common perceptions allows me to suggest motivations for Facebook use and speculate on the impact of preconceived notions of community on the meaning of Facebook in students' social lives.

Perceptions of Community

The viewpoint from which many students approach virtual spaces is heavily influenced by traditional notions of community. Community is generally considered a vital component of human existence - humans are social creatures by nature. As discussed previously, the concept of community has been romanticized in modern culture. Perhaps as a product of the fear of losing community, this idealized notion of community nostalgically looks back to easily discernible community. Removing the geographic proximity requirement of more traditional definitions of community, modern community theory identifies community as a set of values. This trend in community theory is clearly reflected in student opinions of the definition and worth of community membership.

Students clearly understand community as a necessary part of human life.

"Part of being human is connecting with other people." (Student E, Interview 3-07)

"Community means carrying on with a human tradition. It is a fundamental aspect of existence." (Student F, Interview 3-07)

If community is an important aspect of human life then people today are inclined to search for community in many different places. Once easily identifiable by geographic boundaries, communities have become difficult to pinpoint in modern culture, yet, we know they must exist. Students in particular, having grown up during a time period where identifying community was encouraged by social theorists, are quick to identify value aspects of community. When asked to define

and describe community, almost all student participants point to the “sense of belonging” and mutual sense of support that community offers. They mention the “shared experience” necessary for community and the mutual acknowledgment of community responsibility and involvement. Their ideas reflect almost all of the elements of community proposed by Wood and Judikis.

A community is a “group of people who act like one entity.” (Student E, Interview 3-07)

You get a “sense of being able to add to the community and also take something away. (Student B, Interview 3-07)”

The value of community is easily understood by students, because of their active involvement in FtF campus communities. They spend every day in a thriving community where action and awareness are encouraged and even promoted. As a result, students are quick to cite the benefits of community involvement.

“You feel like you have others who you can rely on and support you. It prevents you from being isolated.” (Student A, Interview 3-07)

Yet, even though students seem to grasp the idea of defining community as a value and are able to identify community in terms of these shared values and commitments, they cling to the ideal notion of localized, geographical community. The majority of student participants depict a “neighborhood” of strong, supportive bonds in their picture of community. Their definitions of community have an ingrained physical component.

“Most of community is experience, which is locally based.” (Student A, Interview 3-07)

“It’s more communityish when people are geographically close.” (Student B, Interview 3-07)

By including this component in their notion of community, they inherently value FtF interaction over online interaction in building community - in FtF communities it is harder to be a passive community member. Many students expressed the opinion that online interactions could never compare to real life experiences.

Another interesting necessary component of community, commonly mentioned by students, is a personal involvement and participation within the community itself. For them, community membership involves active interaction among a group of people. Students have a unique position when it comes to community membership because they maintain strong local communities at school. Being an active member of the community is potentially easy because it is already so integrated with day-to-day life on campus. But while most students see community as locally based there is an inherent contradiction in these beliefs. In addition to their FtF communities, they have a broad range of long distance relationships (family and friends from home) that are most often maintained through Internet communication. Yet, the FtF idea of community overshadows any other communal spaces, especially virtual ones.

Facebook Usage

To explore the impact of virtual spaces such as Facebook, we need to understand exactly how the social networking site is used. Facebook users show routines and patterns of use. The typical Facebook user logs onto the site at least once a day, though time spent on the site varies significantly among users - ranging from just a few minutes to hours at a time. Each individual user has a specific pattern of navigating through the site features and information; typically, this reflects a method of looking through the site searching for specific updates and new information. For many students, this involves first scanning through the news feed (which happens to be the homepage), then reading at their new individual messages and wall posts, followed by looking at profile updates, new pictures, etc. Many users are involved in "poking wars," which simply involve poking each other to see who will stop first. Although communication via the social networking utility is possible and used, most students see the site as an information resource rather than a communication medium. Instead, synchronous instant messaging programs are used for communication. The majority of students view Facebook as a tool. They use it mainly as a resource for everything from current events to pictures to relationship statuses.

Specific usage patterns of Facebook are certainly dictated by the user interface itself, but also by the motivations that dictate use. The most highly cited use of Facebook is as a means of pro-

crastination. Students who are bored, putting off work, etc. use the site as an means of wasting time or for entertainment - many students even wish the site had more features to hold their attention. Although Facebook does try to release new features regularly, the site is used daily by most users and some students are already bored with its limited capability.

Students do use the site to communicate - they send messages or post on walls - but this usage primarily constitutes passive interaction. Students recognize their own tendency to snoop or lurk. The concept of *Facebook stalking* has become an acceptable social practice because "everyone does it." But while the majority of interaction is passive, students do believe that information sharing allows them to strengthen and maintain relationships. Just knowing what is going on in their friends lives helps to connect them to that person - it gives them more points of reference about an individual.

"I communicate [with friends] based on profile updates." (Student B, Interview 3-07)

"Access to information helps to build friendships." (Student E, Interview 3-07)

Can passive information sharing really strengthen and maintain friendships or do students simply believe that this is the case because they interact with virtual friends on a regular basis? In many cases, knowing about the changes in a person's life can help to maintain friendships that already have a strong preexisting connection. Because of the reliance of many students on the information shared through Facebook for friendship maintenance, its feature that allow the portrayal of personal identity are important to many student users.

In general, students have a relatively complicated view of identity and privacy issues on the site. Users tend to believe that other Facebook members accurately portray their own identity. Because of the mutual recognition of using the site to stay updated about friends' lives, users try to accurately build their own identity. Yet, they also recognize the potential danger of forming preconceived notions or judgments of an individual's personality based solely from the available profile information.

"It is very very hard to get past initial perception of personality." (Student A, Interview 3-07)

But in general the efficiency of building and strengthening existing friendships through the site makes up for any perceived shortcomings. Most of current concerns with the site stem from privacy issues. When Facebook was first brought to the campus students rarely worried about privacy issues. There was a tendency to transfer the campus sense of security to the site itself. The issue of security has drawn more attention recently, as Facebook has opened up to the general public. Rumors about administrators and employers on the site force students to question and change individual privacy settings, as well as restrict information available on their profile.

Overall, students use Facebook primarily as an information source - one that has become vital to day to day life on campus. Checking Facebook has become as commonplace as checking email or news online. The Facebook is used to strengthen preexisting friendships and maintain (keep updated on) long distance friendships. The online friendship network of Facebook is built directly upon FtF interactions. Students say they rarely use the site to develop new friendships with individuals who they have never met. The majority of interaction consists of passive, asynchronous discussion through messages and wall posts. Facebook provides students with an efficient means of information sharing - ranging from general announcements to personal characteristics and interests.

Interplay Between of Virtual Spaces and Community

Virtual spaces tend to have a distinct effect on the FtF communities they mirror. Facebook, specifically, has a large impact because it is so closely tied to FtF communities. First and foremost, Facebook has become the medium for information sharing. Lectures, parties, sporting events, and even protests are organized and advertised via Facebook groups, events, and messages. The site is also used to share media - pictures and links to movies and interesting articles are all shared through Facebook profiles, notes and posted items. Not only is Facebook utilized by its strong member base as an information resource, but it begins to replace other forms of information sharing. Many students no longer bother with sending email advertisements or fliers when promoting specific events. Facebook accounts for the grand majority of students on campus, but for those who don't have Facebook profiles, there is definitely a loss of connectedness to the FtF community.

While Facebook has the ability to replace many daily actions, it also becomes integrated with day-to-day life in a much simpler way. Facebook has become so commonplace among students, it no longer remains a solely virtual space. In many ways it dictates social norms and behaviors. Students regularly discuss recent new online “friendships” by telling friends: so and so added me as a friend of Facebook last night or did you see what so and so wrote on his/her profile? Facebooking has become an acceptable form of preliminary interaction, friendship formation, and flirtation. Many romantic relationships have been made official in the public sphere by recognition of Facebook and Facebook flirting allows students to initiate preliminary romantic interest in a somewhat casual manner..

“A big way I would flirt with girls was through the Internet.” (Student F, Interview 3-07)

Through private messages and wall posts, students can attempt an informal first step in dating. Many students believe they were able to get to know acquaintances through initial Facebook interaction, enough to actually pursue a FtF romantic relationship in person. Facebook’s effectiveness in influencing norms of social behavior results from its strong integration with FtF communities. Thus, Facebook usage spills over to FtF interaction.

The influence of FtF interactions on virtual spaces is also an interesting point of overlap. Specifically, in the case of Facebook, the virtual community is based almost entirely on the FtF community, but the strength of interactions is entirely different. On Facebook, there is nothing to distinguish which connections are stronger than others - all friendships are put on an equal platform. This gives a somewhat false sense of friendship - who is to say which “friends” are your close support group and which are just acquaintances you met at a social event for a few hours.

Students seem to recognize that many Facebook friendships are not “real” in the sense that FtF connections are, but at the same time, they use the site to form opinions and perceptions about their “friends.” This idea of friendship is problematic because Facebook itself only provides a very targeted subset of information about each individual, thus perceptions of character are inevitably established and perhaps weighted entirely differently than they are in FtF interaction.

Notions of Virtual Communities

Students have very definite opinions about virtual communities. The majority of students do not consider virtual spaces communities. In fact, they have very strong, negative reactions to doing so. Most students do not believe that virtual communities exist.

“Online communities are bogus. (Student C, Interview 3-07)”

For many, there is simply no better term than community to use for this new type of social group. They see a distinct separation between interaction in real life and interaction via the Internet.

“We do not have a better word than community. The language glorifies online communities and makes them seem like more than they really are. (Student E, Interview 3-07)”

Students see Facebook as a social networking tool rather than as a supportive, communal group. Based on their own definitions, as discussed earlier, this might stem from their notion of community as a physical entity or involving active participation from multiple group members. A few students did acknowledge that virtual communities exist, but they were careful to say that Facebook was not one of them. For these students, Facebook was again simply a tool used as an efficient, extension to FtF community. When pushed to cite the differences between Facebook and community, students found it hard to clarify their intuition. A few students cite the lack of group interaction, while others see a difference in the active participation they experienced.

“Community must have a more personal involvement.” (Student B, Interview 3-07)

The idea that participation must be an active component of community membership leads to an inherent value judgment of virtual spaces that do not allow for direct group interaction. Since it lacks the group communication and discussion abilities to make interaction more than just superficial, Facebook is considered a device, that is used much in the way we now use telephones. In this way, virtual spaces themselves does not exemplify community.

6.7 Implications for Community Theory

College students constitute a significant part of society. Today's students represent a transition population - one of the first generations to be raised with Internet technology. Current college students have an intuitive understanding of online spaces and tools, but at the same time they have personal experiences of community without such technology. As such, students are hesitant in calling virtual spaces communities. It is interesting to consider, however, the consequences of removing the strong localized community and allowing students to reevaluate their notions of virtual spaces, that is, do their opinion change after they graduate and no longer live on campus? I will examine this question in the next section.

Modern community theory makes the transition from thinking about community in terms of geographical boundaries to a more dynamic definition by viewing community as a set of shared values which can be communicated and sustained through individual's social network. Yet, there seems to be a disconnect in the ideas about community held by these social theorists and the general public, specifically students. The literature of modern community theory, in particular virtual communities, believes in the ability of virtual spaces to build social capital. Many researchers have shown that the Internet allows for intense human communication, which is the foundation for building community. Students, on the other hand, are heavily influenced in their perceptions of community by the strong, localized campus community they see daily through FtF interactions. Because they experience such a broad based support group, they are less inclined to feel a loss of community or sense of belonging. It was this fear of losing community benefits that pushed modern community theorists to look for community in nontraditional forms - social networks and virtual spaces. But for students, this need to search for community online is absent. Thus, they consider virtual spaces like Facebook merely tools for communication and information exchange. From this background, the usage patterns of Facebook are almost predetermined. As seen in previous sections, students find Facebook communication informal and superficial on some level. They rarely use the social networking tool to build new friendships, but only to strengthen preexisting bonds. Yet, even this process is fairly hollow. Building friendships on Facebook most often implies passive information gathering, rather than meaningful communication and interaction.

In this study, combining research from both statistical and sociological perspectives, offers further insight into the use of Facebook by students. Students do not consider Facebook an isolated virtual space, but instead an extension of FtF community based on the same strong, broad relationships that are maintained through their FtF relationships. Facebook not only incorporates these bonds, but it allows for an increase in the number of weak links that can be easily maintained via this new virtual space. The strong localized community gives Facebook friendship networks a high clustering. The combination of a highly interconnected local structure and the large number of weak links is seen in the small average distances with these networks. Both the narrow and broad links that are supported by Facebook social networks are considered vital aspects of community by social theorists. Recall, that one of the most interesting aspects that comes into question with modern virtual spaces and community is the balance of these strong and weak links.

Facebook itself is not the best version of a virtual space to investigate the proportions of such relationships, but it does give an idea of what we would see in other virtual spaces. We have no measure of friendship strength on Facebook, but we do see a significant increase the total number of friendships maintained. As mentioned earlier, the average number of friendships on Facebook is about 150. Historically, social theorists have estimated that, ideally, a community would contain approximately 150 members. Sometimes called Dunbar's number, this estimate deals only with FtF interactions. So what are the consequences of virtual spaces on maintaining friendships? Obviously, Facebook does not represent an individual's entire social network. In reality, it probably only represents a subset of the network, perhaps delineated by age. In this small subset of an individual's social network, we already see a "maximum" number of relationships. It follows, that virtual communication and accessible spaces must allow individuals to maintain a more than "normal" number of total relationships. The ease of social interaction on the Internet allows this increase in friendships. While the total number of friendships one person can maintain increases, we still need to determine the balance of strong and weak ties that are represented by these new friendships. The changes in this balance could have potentially unforeseen consequences for community support and growth. Social network statistics - specifically, the high clustering of these networks - point to strong links; but, from personal accounts, we see an increase in mostly weak

links. The high clustering results from the relatively small local environment on which the virtual network is built.

As students leave the local community, maintaining all their connections will come at a higher cost. In this new global environment, virtual spaces become vital to communication and sustaining friendships. It is this new ability to support old connections that makes virtual spaces the frontier of modern community theory. While many have been shown to be a valid space for community and friendship building, there are still spaces that don't offer such personal and emotional involvement. Whether classified as communities or not, virtual spaces are definitely changing the architecture of communities themselves. Changing the balance of strong and weak interactions that can be maintained in personal communities could potentially have significant consequences for sociology and psychology.

6.8 Community after College?

We have explored in depth at the use of Facebook by students who maintain a strong FtF community. Does this use change after students leave the campus community? In the course of this research, we had the opportunity to interview an alum of Pomona College. An avid Facebook user at the beginning of college, he deactivated his account during his last year at school, only to reactivate it after leaving school. As a means of connection, Facebook's success is undeniable. Although one individual's experiences are not representative of the population as a whole, it is interesting to consider his reflections because they shed light on possible changes in perceptions of virtual spaces that occur after leaving a strong localized community - changes that one previewed in current student opinions and can now reinforce.

While modern community theorists signal a diminishing sense of community, the fear of losing community is not present among current students. They do not see a loss of community because they experience such a thriving FtF community on campus. Upon leaving this strong localized community, however, there may be an acute sense of community loss.

"The fact that community is physically and metaphysically decreasing in the past

decades truly frightens me. We don't have as strong a community as we used to. It's a fundamental shift in the fabric of our being and I don't know what that is going to mean for the future of our species." (Student F, Interview 3-07)

This is a much different approach to thinking about community itself. It is a recognition of many of the ideas of modern community theory absent in the opinions of students who still actively participate in the campus community itself. Not only does this differing idea of community affect the use of Facebook, it also gives a new perspective on virtual spaces in general.

Virtual communities are a "shared space, which really is the definition of a community - shared space and continuous interaction with the same people. " (Student F, Interview 3-07)

The lack of a strong localized community makes individuals more open to the idea of looking for communal spaces online. Virtual communities like the blogger community are examples of sustained interaction and discussion among a core group of members. Though Facebook still differs from this model for virtual communities, it is used differently in this new (weaker) community setting.

"It is valuable as a tool beyond just keeping up with old friends. It is good for making new friends too. [I "meet"] friends of friends online." (Student F, Interview 3-07)

Here, the usage of Facebook has shifted as a result of removing the local FtFc community. Making new friends on Facebook is rare on small college campuses, where interaction normally occurs FtF first. Without the FtF interactions, individuals are more likely to turn to virtual spaces to expand their social network and develop meaningful connections. Interestingly enough, however, even as a venue for making new friends, Facebook still differs from other online communities.

Approaches to Facebook are determined by the FtF community from which the social network is built. In the case of students, who interact with the majority of their Facebook friends in person, Facebook is an extension of their FtF community and used primarily as a means for information exchange. When that FtF community is removed, in the case of recent graduates, Facebook may carry more weight not only in maintaining but in building new friendships that

could be then transferred to a localized FtF interaction. Social networking services like Facebook allow individuals to expand their own social network through mutual friends. We have seen that local community affects student approaches to virtual spaces; while the spectrum of usage makes it difficult to classify Facebook as a virtual community, it is a tool that bridges one FtF community with the next.

6.9 Is Facebook.com a Community?

To consider whether we can designate Facebook as a (potential) community, despite the opinions of many of its users, we refer to the visible features of community that we conceptualized in previous chapters. Facebook certainly influences the day-to-day life of users as well as non-users. Facebook users are exposed to a wealth of information about campus events and changes through user profiles and groups. The prominent presence of Facebook on college campuses makes it an interesting virtual community to consider from the background of community theory and changing definitions of community. Not only does it involve virtual communication and network building, but it also affects the FtF interaction of users. We must be careful to distinguish, if even possible, the Facebook community from the FtF community; most Facebook users, especially on a small college campus, build their online social network from real life interactions.

If we approach Facebook from the modern viewpoint that community can be thought of as an individual's social network, then Facebook undoubtedly seems like a community (perhaps one of many). But is it really a viable community on its own, or is it simply an extension of a preexisting community? To answer these questions we must consider the community traits discussed in previous chapters. Recall that these traits include:

1. A sense of common purpose(s) or interest(s) among members.
2. An assuming of mutual responsibility.
3. Acknowledgment (at least among members) of interconnectedness.
4. Mutual respect for individual differences.
5. Mutual commitment to the well-being of each other.

6. Commitment by the members to the integrity and well-being of the group, that is, the community itself.

The difficulty in this task of considering Facebook as a community is to distinguish between the virtual and FtF communities. Facebook is so strongly integrated with the FtF community at small college campuses, that in many cases this is not entirely possible. Facebook obviously has a common sense of purpose and interest among students - they are there to share information and communicate with each other through such information sharing. Students also share a sense of mutual responsibility in many cases. The development of the site itself, specifically the new features, has been heavily influenced by the user base. Members take pride in understanding and demanding the highest user satisfaction with the site. The third element of community, according to Wood and Judikis, however, it a bit harder to argue. It is obviously present within the FtF community at such as small school, but the transition from real life to virtual space more difficult to make. Along with the last elements of communities, this notion of what characterizes community might not be present within the site itself - it is more likely to be a byproduct of the FtF community. Facebook becomes an extension of community because it is so tied to FtF community on campus. Beyond this influence, it is difficult to actually designate it as a virtual community.

Chapter 7

Concluding Remarks

Exploring the usage of Facebook on a localized college campus reveals interesting consequences of the impact of this virtual space. Students utilize the site in a variety of different ways - for information exchange, flirtation, and maintaining friendships. Because of the students' approach to Facebook as an extension of FtF community it difficult to separate these two communal spaces. Based on my research, Facebook lacks the interactive, group communication medium that would encourage students to view the space as a virtual community; instead, it remains simply a tool in their minds. Yet, the impact of such virtual spaces on FtF community is undeniable. Not only does the structure of community itself change, but there are different approaches to community based on experiences with virtual spaces. Virtual spaces dictate social norms and patterns of acceptable behavior among students.

Comparing virtual spaces to FtF community within the context of community theory provides an interesting challenge. Modern community has become a malleable entity - a dynamic structure that is constantly changing. Yet, the values of community have persisted. Visible in student notions of community is the idealized notion of geographically based groups, but interestingly enough they also understand the values inherent in community participation. So what is stopping these values from being applied to virtual spaces? I believe the majority of their reluctance is due to active community involvement on campus - students do not have to look far to find a thriving community. But upon graduating they no longer have such a vibrant localized community, as

a results students may become more open to the idea of finding community online.

Approaching the mathematical component of my research after such extensive sociological background gave me a new perspective on the value of STS studies. Current social network analysis tends to put too much weight on mathematical measure of community structure. Yet, as a supporter of mathematical insight, the realm of social network analysis was extremely interesting to explore. My research supported my intuition that the balance of strong and weak ties that are maintain online is changing. I believe it would prove extremely valuable to conduct a longitudinal study of incoming freshman and graduating seniors to study the growth and structure of social networks during these two very different time periods - I hope to further explore this idea in future research.

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