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CATCHING THE VIDEO VIRUS: UNDERSTANDING INDIVIDUALS INVOLVED IN DIFFUSION OF ONLINE VIDEOS THROUGH SOCIAL NETWORKS

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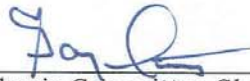THESIS APPROVAL

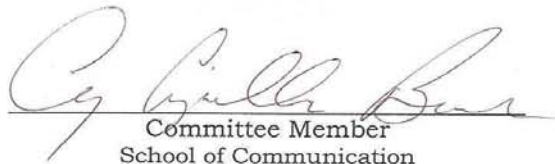SCHOOL OF COMMUNICATION

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IN DIFFUSION OF ONLINE VIDEOS THROUGH SOCIAL NETWORKS

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ABSTRACT

In the process of computer-mediated exchange, some online videos travel from one person to another resulting in the process of diffusion of the video. However, there are very few empirical investigations of the audience involved in the process.

This exploratory research employs Rogers' diffusion of innovations as a theoretical framework to study online video users. Theories from social networks on tie strength and homophily are applied to create an integrated diffusion model. Based on survey data from college students, online video audience was profiled in two ways: one based on individual characteristics and another on activities with video content. Participants in the viral transmission process were found to be novelty-seekers, highly connected to others and appreciative of entertaining videos. An integrated model exploring the antecedents of viral transmission of online videos identified age, sex, Internet usage, and network connectedness as significant predictors. Contrary to previous findings, strong and homophilous ties were found to significantly contribute toward the viral spread.

The findings of this study will add to the body of knowledge on diffusion research by enhancing understanding of individuals involved in an evolving medium. A profile of online video users will help marketers identify and reach the right audience.

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CHAPTER I

INTRODUCTION AND RATIONALE

The Internet has become a part of our way of life. The online population
continues to grow rapidly and those who do not go online constitute an ever-shrinking
minority. With the development of the Internet and other interactive technologies, the
focus of computer mediated communication (CMC) has broadened. Computer-mediated
or technology-based communication is now faced with a new phenomenon *viral
communication*. At first, the term viral communication sounds disagreeable and
unpleasant. The thought of a virus makes one a little uncomfortable.

What makes a virus? A virus lives in secrecy. It lives and works invisibly and is
infectious. It keeps attacking further and further, replicating itself, until it has grown
enormously and has created a critical mass in order to throw the system under
consideration out of its equilibrium. It can replicate itself only by infecting a host cell,
thereafter appending with other hosts. In the right kind of environment, a virus grows
exponentially, replicating itself and increasing manifold with each iteration.

Viral Phenomenon in Computer Mediated Communication

What does a virus have to do with communication? Any kind of communication implies interchange of thoughts, opinions, or information through speech, writing, or signs. CMC is one such interchange that occurs via computer-mediated formats (instant messages, e-mails, chat rooms) between two or more individuals. Among other things that get exchanged through these computer-mediated formats, video clips have become very popular. Videos are short clips predominantly found on the Internet. They are usually freely available, which explains their current popularity. In the process of computer-mediated exchange, some of these video clips keep traveling from one person to another and are termed as viral videos. The term *viral video* refers to a video clip content which gains widespread popularity through the process of Internet sharing, either through e-mails, instant messaging, blogs or other media sharing web sites. Most of these videos are humorous, comprising jokes and televised comedy sketches. A huge portion of the repository consists of user-generated videos shot by amateurs on camera phones. Such user-generated videos are typically non-commercial in nature, intended for viewing by friends or family. There also exist videos used by a number of organizations for their marketing practices. These organizations use marketing strategies that encourage individuals to pass on these videos to others, creating the potential for exponential growth in the video's exposure and eventually, product awareness.

What makes the process viral is the continuous forwarding of these videos from one person to another. It works well on the Internet because of the ease of transfer and replication. One reason for the recent sudden explosion of viral videos on the Internet is a rising number of Web users with fast broadband connections that allow them to watch

videos. Broadband penetrations in US homes and workplaces have been reported to be 79% and 93% respectively in January 2007 (Nielsen/NetRatings as cited in Website Optimization LLC, 2007). In the past year, web sites like YouTube, eBaum's World and JibJab have emerged as repositories for some of the best and most well-known viral videos. The most popular of all, YouTube, allows people to upload their videos for the world to see and has grown from 5.7 million visitors in November 2005 ("Viral videos", 2006) to around 20 million unique visitors now (New Media Knowledge, 2007).

The viral phenomenon sets into action when the viewer sends out the video to her friends, family members and other acquaintances. Those individuals who receive the video repeat the process, growing the total number of recipients. And thus begins the process of diffusion, growth and transmission of the video.

Statement of Problem

Howard (as cited in the CIA Advertising report on Viral Marketing, 2005) states that viral videos are today's equivalent of old-fashioned word-of-mouth. It is a strategy that involves creating a video that is novel or entertaining enough to prompt viewers to pass it on to others – spreading the video across the web like a virus. Entertaining or provocative videos can quickly become viral, being shared by hundreds of viewers, most of them connected through online social networks. The relationships between individuals inside existing networks work significantly well, resulting in an amplifying impact on transmission of the video. Viral videos have reached out to a broad set of individuals and this is attracting considerable attention both commercially and non-commercially. Thus, it is important to understand the people involved in the process and the relationships they

share with others who participate in the same process. Research examining the viral phenomenon currently provides either descriptive accounts of particular initiatives (Krishnamurthy, 2001) or advice based on anecdotal evidence (Andrews, 2002 as cited in Subramani & Rajagopalan, 2003). What is missing is an analysis that looks at the individual level highlighting systematic patterns in the diffusion of the video.

An idea or innovation, after appearing, can either die out quickly or make significant inroads into the population. Similarly, a video can either get erased quickly or gain widespread popularity within the network through which it travels. To understand the extent to which such videos are diffused, making them viral in the process, it is important to understand how the dynamics at individual level are likely to unfold within the underlying social network. The primary issue that needs to be addressed is related to individuals' engagement in online viral transmission.

Purpose of Research

Word-of-mouth communications have received extensive attention from academics and practitioners in terms of understanding the reasons why consumers proactively spread the word (Dichter, 1966), understanding the circumstances in which consumers rely on such communication (Gilly, Graham, Wolfinbarger & Yale, 1998), and understanding why certain personal sources of information have more influence than others (Brown & Reingen, 1987). Despite online word-of-mouth becoming widely popular, academic researchers have only recently started to examine this significant topic (e.g. Ha, 2002; Xue & Phelps, 2004). Most of the research cited here looks at referrals that are commercial in nature (e.g. specific to companies and their products). Research is

biased toward successful word-of-mouth communications, that is, it reports on communications that have actually influenced the decision maker in terms of purchasing the product (see Brown & Reingen, 1987). While these studies provide useful information about factors related to word-of-mouth communication, they do not explain the factors that account for individuals' engagement in online videos and their resulting activities.

Noting the current lack of literature on viral videos, this research primarily looked at videos that get diffused through the Internet which have no tangible incentive for the sender. The purpose of this research was to gain a better understanding of the individuals involved in the process. The idea was to create a typology of users with a hope to apply the results both in academic and applied contexts. In the academic context, documentation of such a typology will enhance our understanding of those individuals who are prone to seeking and transmitting online videos and eventually create online communities as a venue for sharing interests and ideas. The results of this study, in the applied context, can be applied to practices of viral marketing. Most of the commercial viral marketing campaigns do not have a very good understanding of the kind of audience they are catering to. There is a lack of clarity about whether viral video clips used by marketers and advertisers can drive targeted traffic for the intended commercial purpose. It was expected that the results from an individual-level analysis for viral video transmission would help marketers better understand the people involved; inject their messages into appropriate communities and relationships; and systematically select their target groups eventually leading to successful results.

Investigating the Viral Process

The viral transmission of online videos can be thought of as diffusion of a piece of information by means of a video and its adoption over a network. Wejnert (2002) proposed a conceptual framework to study diffusion research integrating the variables that create an impact in the process of diffusion. Drawing from this framework, the present study had four objectives. The first objective was to profile individuals involved in viral transmission of online videos based on their personal characteristics. Secondly, drawing from personal characteristics, the study aimed at determining the factors that predict likelihood of viral transmission. The third objective was to distinguish the individuals based on the content they viewed and/or transmitted. The last and final objective was to study the role played by social relationships between individuals.

Profiling Individuals based on Personal Characteristics

Individuals in a social system do not have the same behavioral tendencies toward an online video. Some might be prone to search for it actively. Some others might be interested in viewing such videos via other means such as e-mails, blogs, or instant messaging. There might be others who rarely engage in any of these processes. As shown in most diffusion research, a lot of this online behavior is predicted by inherent traits and characteristics. Thus members of a social system can be classified into categories based on their characteristics, with each category consisting of individuals with similar characteristics.

Factors predicting Viral Transmission

Personal and individual characteristics serve as antecedents to the probability of diffusion in a network. These characteristics substantially influence and modulate the diffusion process (Wejnert, 2002). As such, the viral transmission of an online video appears to be correlated with individual characteristics.

Profiling Individuals based on Content

Studying differences between individuals based on their activities with the video content is helpful in predicting their reactions toward it. The importance of this type of profiling lies in the fact that different types of reactions between the video content and individuals result in different diffusion patterns. Thus, based on individuals' likelihood of viewing and forwarding certain types of videos they can be classified into categories.

Relationships between Individuals

Diffusion research emphasizes the importance of relationships between individuals on adoption of an innovation. Since viral videos get diffused electronically from one individual to another, the relationships between individuals are expected to play an important role in the process. A relational analysis looking into the type (homophily or heterophily) and intensity (strong or weak) of relationships between individuals will explain if viral effect in an individual's network is affected by relationships with others.

CHAPTER II

LITERATURE REVIEW AND CONCEPTUALIZATION

The term viral video refers to a video clip content that gains widespread popularity through the process of Internet sharing, either through e-mails, instant messaging, blogs or other media sharing web sites. (The Computer Desktop Encyclopedia, 2001). It refers to the video's lightning-speed dissemination from one person to another through e-mail links, text messaging and word-of-mouth. With the proliferation of camera phones, many videos are being shot by amateurs on these devices. The availability of cheap video editing and publishing tools allows videos shot on mobile phones to be edited and distributed virally. Viral videos range from the crudest – a teenager singing a funny song in front of a cell phone camera – to the most polished – professional outtakes from TV shows, music videos or movie trailers. They range in time from a few seconds to 15 minutes and longer, though most tend to be short. They vary from brilliant to stupid, humorous to serious and informative to time wasting.

Viral is taking on a new meaning today. It is a way to explain the rapid spread of a message through technology. Technology has taken word-of-mouth to a new level, empowering consumers like never before. Internet video clips are taking it a step further.

These short videos have flooded the Internet in recent months. The popularity of viral videos is an example of social networking at its best – passing information or entertainment in the form of short video clips from one friend to another via e-mail or through other social networking web sites. The phenomenon is similar to the process of diffusion: the spread of information through a social network. This has created a need for both theoretical understanding of and empirical research on this widespread phenomenon. Factors such as characteristics of people involved in online viral transmission, activities engaged with the video content, and individuals' relationships with others are imperative to be answered to be able to begin to understand the process. Determining the factors mentioned above required an understanding of individual-level and innovation-level characteristics that are responsible for adoption of the viral video phenomenon. Additionally, it was proposed that the understanding of relationships between individuals would throw more light on how ties affect the phenomenon.

The objective of this research was to create a typology of users (online video audience) categorized based on their viewing and forwarding behavior and being able to differentiate them further based on their characteristics and the type of content viewed. Thus the overall research for the study question was formulated:

RQ: What individual characteristics and types of video content best differentiate between categories of online video audience?

Furthermore, this research aimed at investigating how strengths and types of ties affect the diffusion pattern. Based on this, the viral video phenomenon could be understood through an analysis of characteristics of individuals, that of video content, and that of relationships that exist between individuals. It was proposed that the process could

be understood from the perspective of diffusion of innovations (Rogers, 2003) model. Concepts from social networks were applied to understand relationships between individuals.

There is a rich literature around diffusion through networks from a variety of fields, ranging from epidemiology to marketing. A lot of past research investigating the flow of information through networks has been based upon the analogy between the spread of disease and the spread of information in networks (see Anderson & May, 2002). The classical disease propagation models are based on different stages of disease in a host. Thus SIR (susceptible-infected-recovered) models situations where a recovered person never again becomes susceptible, while SIRS (susceptible-infected-recovered-susceptible) models situations in which a recovered host eventually becomes susceptible again. Similarly, the diffusion model proposed by Bass (1969) has been used extensively in the field of marketing, especially for forecasting product adoption. The Bass model predicts the number of people who will adopt an innovation over time. It does not explicitly account for the structure of the network but assumes that the rate of adoption is a function of the current proportion of the population that has already adopted the innovation. It effectively models word-of-mouth diffusion at the aggregate level but not at the individual level (Leskovec, Adamic & Huberman, 2007).

A limitation of these types of models is that they assume a known social network over the message spreads. Also, these models usually assume a single parameter which specifies the infectiousness of the disease or the diffusion of the product (see Leskovec et al., 2007). In the context of viral videos, however, the network is a computer mediated one and much different from a face-to-face network. Also, there are multiple factors that

govern the diffusion of the video. Hence, such models would be inappropriate to examine viral spread of online videos.

There are numerous other models of information propagation through social networks. One of the first and most influential models is that of diffusion of innovations proposed by Rogers (2003).

<center>Diffusion of Innovations</center>

Diffusion of innovations (Rogers, 2003) is the study of how, why and at what rate new ideas spread through cultures. Innovation is any item, thought or process that is viewed to be new. The perceived newness of the idea for the individual determines his or her reaction to it. As per Rogers (2003), newness in an innovation need not just involve new knowledge. It can also be expressed in terms of persuasion or decision to adopt. "Diffusion is the process through which an *innovation* is *communicated* through certain *channels* over *time* among the members of a *social system*. It is a kind of social change defined as the process by which alteration occurs in the structure and function of a social system" (Rogers, pp 5-6).

The spread of a piece of information or of a video through a social network can be viewed as the propagation of an innovation through the network. The success of communication through online videos can be explained using the above model, which refers to the dissemination of information, abstract ideas, concepts and practices within a particular group. The dynamics may vary in size from a group of close peers, to a large group of known and unknown individuals, to an organization or company, to even an

entire cultural or social system (Rogers, 2003; Wejnert, 2002); all being different forms of social networks.

Rogers (2003) identifies four key elements in the model:

1) Innovation

2) Communication channels

3) Social system

4) Time

Innovation

Innovation is defined as any idea, process or object considered new by a particular individual or group. Over time, members of society have associated with more specific examples of innovations in their minds; most commonly with respect to technological inventions. However, as defined above, an innovation is simply something new. For the purpose of this study, an innovation was considered to be any new idea, thought or message that is propagated in the form of videos. In other words, the video itself was the innovation.

Communication Channels

Communication channels represent the medium through which the information is disseminated to others. They can vary on a multitude of elements and each plays a part in its use and importance within a particular population. For viral videos, the communication channel is primarily the Internet through which the videos get circulated. Another medium through which these videos get propagated are mobile phones via the

process of text messaging. The frequency of use of mobile phones as a medium for propagation is, however, very low (Pew Internet Research, 2007). This research, therefore, looked at the Internet as the primary channel of communication.

Social System

A social system also known as a social network is a group of people that are connected to each other by some common purpose or goal. Weenig and Midden (1991) describe a social network as "an aggregation of individuals who may or may not be linked to each other by communication ties" (p. 735). The importance of ties in which people are involved is a key concept underlying social networks (Scott, 1991) in that they provide the route for information exchange and innovation diffusion. Weenig and Midden (1991) found that the number and strength of ties are important during adoption of the innovation. There are a number of ways in which ties within networks have been classified (e.g. Granovetter, 1973; Granovetter, 1982; Weimann, 1983). As a result of these ties viral video users form a social system engaged in sharing videos and being part of a community.

Time

The time dimension is involved in diffusion in three ways. First, time is involved in the innovation-decision process. The innovation-decision process is the mental process through which an individual passes from first knowledge of an innovation to forming an attitude toward it, to a decision to adopt or reject it, to implementing it, and to confirmation of the decision. The individual seeks information at various stages in the

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innovation-decision process in order to decrease uncertainty about an innovation's unexpected consequences. The second way in which time is involved in diffusion is in the innovativeness of an individual compared with other members of the system. The third way in which time is involved is the innovation's actual rate of adoption in a system measured with respect to the number of members adopting it. For this study, time was investigated as the innovation-decision process through which an individual passes from first knowledge of the video to forming an attitude toward it, to a decision to adopt (view/forward) or reject it (not view).

Adoption

"Adoption is a decision to make full use of an innovation as the best course of action available" (Rogers, 2003, p. 21). It is a stage in the decision making process where the individual decides to either accept or reject the new idea. Adoption of an innovation is a process. Depending on the innovation, adoption could have several different meanings. If it is a new product, adoption may be defined as an actual purchase. If it is a new theory or process, adoption may be its use and application. The amount of time for any particular innovation to go through a channel is related to the innovation itself; the sources used for dissemination; and the amount and strength of ties within the network. One of the factors essential to ensure success of adoption and diffusion is a regular and repeated use of the innovation.

The process of videos going viral over the Internet may involve any one of the two steps: viewing the video or passing it on to others after viewing. However, individuals who view the video and those who share the video are likely to be parts of

two separate diffusion curves due to difference in the nature of adoption. One refers to adopting the innovation just by pure watching; the other refers to adopting the innovation by passing the video further in the network – both contributing to the viral effect in their own ways. For the purpose of this research it was decided that viral effect would be investigated keeping in mind the two different behaviors - viewing the video and forwarding it. An individual engaging in either viewing the video or forwarding it on could thus be categorized as an adopter. However, passing on the video further to members in the network is an additional step over and above viewing the video which aided in the viral process.

Online video audience categories

Rogers (2003) has classified individual members of a system into adopter categories based on their innovativeness. Each category consists of individuals with a similar degree of innovativeness. Innovativeness, the criterion for categorization, is defined as "the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of a social system" (Rogers, p. 280). Base on innovativeness, Rogers partitions audience to create five discrete categories: innovators, early adopters, early majority, late majority, and laggards. Innovators are venturesome, eager to try new ideas and often outside the local circle of peer networks and relationships. Early adopters are respectable; more integrated into local peer networks and relationships, and have the greatest opinion leadership within most social systems. Early majority usually deliberate before adopting a new idea. Individuals in this category follow willingly rather than lead in adopting an innovation. The late majority are

skeptical; approach innovations cautiously, and do not adopt it until most others in the system have. Finally, laggards are traditional individuals; last in a social system to adopt an innovation. They tend to be suspicious of innovation and change and prefer to follow traditional approaches.

Rogers' (2003) idea suggests that a set of categories created using a variable should be 1) exhaustive, including all units of study, 2) mutually exclusive, excluding a unit of study that appears in one category from also appearing in any other category, and 3) derived from a single classificatory principle. The same idea can be used to create categories of online video audience based on their viewing and passing-on behavior. Individuals either view or do not view the video. Some view it on video web sites itself; others view it after receiving the video from friends, family or acquaintances through e-mails. They tend to either forward it or not forward it. A combination of these three factors helps to categorize the online video audience in the following way:

1) *Initiators:* This category consists of individuals who actively seek out online videos. They first view these on web sites and start the process of sharing it, thus initiating diffusion of the video. Initiators are people who start the process of sharing the video with others in their personal network once having viewed it. They are welcome to watching new videos and enjoy sharing them with others.

2) *Viewers who forward:* This category consists of individuals who view the video, either on web sites or after receiving it through e-mails, blogs or any other online means. They could receive the video from initiators or from some

other member in the social system and pass it on to others in the system. They

contribute to the viral effect of the video by continuing the process.

3) *Viewers who do not forward:* This category consists of individuals who view

the video; either on web sites or after receiving it through e-mail, but rarely

pass it on to others in the social system. In this case, contribution to the viral

effect is only in terms of viewing.

4) *Non-viewers:* This category consists of individuals who very rarely view the

video. It is important here to note that this category of individuals does receive

videos. However, they do not engage in continuing diffusion of the video. Not

only do they not visit web sites seeking out for videos but also do not pass

these videos on further in the system after receiving them. They do not

contribute to the viral effect of the video.

These four categories described above fulfill each of the three principles of

categorization suggested by Rogers (2003). The four categories are exhaustive, mutually

exclusive, and derived from one classification principle – online viewing and forwarding

behavior. The objective here was to gain a better understanding of each of these

categories by being able to differentiate between them. Within the theoretical framework

of diffusion theory, it was expected that each group would comprise individuals with

similar characteristics.

An Integrated Framework

Extensive research has been done on studying diffusion of diverse innovations

and technologies (e.g. Burt, 1987; Rosero-Bixby & Casterline, 1993; Ryan & Gross,

1943). However, most of it tends to analyze diffusion with reference to a variety of concepts and variables that have been treated in isolation from each other. Wejnert (2002) provided a conceptual framework for integrating the array of variables defined in diffusion research to explicate their influence on an individual's decision to adopt an innovation. The framework grouped the variables into three major components. The first component includes characteristics of innovators that influence the probability of adoption of an innovation. The second component involves characteristics of the innovation itself. The third component revolves around the social and environmental contexts that modulate diffusion. Applying the same framework to viral videos enabled to obtain a better picture of how various factors such as individual level characteristics, video content, and ties between individuals played roles in diffusion of the video.

Characteristics of Online Video Audience

Individual level characteristics

Since rate of adoption of an innovation typically depends on the interaction between individuals (Rogers, 2003), a major focus in diffusion research has been on individual level characteristics that mediate the interaction processes. These are a) Personality traits, b) Communication behavior and c) Position in social networks.

Personality Traits. Weimann and Brosius (1994) suggest that self-confidence and independence, together termed as psychological strength, are the personality traits that seem to be relevant to adoption of innovations. Psychologically strong individuals select the most important innovations, rapidly adopt them, and using their own social networks

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create a public agenda that significantly promotes adoption. Conversely, psychologically weak individuals depend on the opinions of stronger individuals to relay them the information. In a similar vein, Menzel (1960) showed that self-confidence and risk-taking characteristics of individuals affect their receptiveness to novel information as well as to the rate of adoption of innovations. Burt's (1987) research concluded that the rate of adoption within interpersonal networks is modulated by variables that determine openness of individuals to novel information.

All the above constructs were summed into one and equated to the individual level personality trait *venturesomeness* as defined by Rogers (2003). He associated venturesomeness with innovators. Their interest in new ideas leads them out of a local circle of peer networks and into more cosmopolite social relationships. Communication patterns and friendships among a group of innovators are common, even though these individuals may be geographically distanced. "The salient value of an innovator is venturesomeness, due to a desire for the rash, the daring and the risky" (Rogers, p. 283). The innovator plays an important role in the diffusion process: that of launching the new idea in the network by importing the innovation from outside.

In the world of viral videos, these traits are more likely to be associated with those individuals who actively seek out such videos and initiate the process of diffusing it. These initiators are individuals who start the process of sharing the video with others in their personal network once having viewed it. Pew Internet Research (2007) reported that 57% of online video viewers share links to the videos they find online with others. About 3% consistently find content that is compelling enough to be shared on a daily basis. This 3% is likely to comprise the "initiator" category. Initiators are welcome to watching new

videos and enjoy sharing them with others. Considering the fact, that they share videos with others frequently they are expected to have a more favorable attitude toward novelty and change when compared to others in the network. Since these initiators upload videos for others to watch it, rate videos and post comments after them (see Pew Internet Research, 2007), it was expected that Rogers' (2003) concept of venturesomeness would be applicable to them. Venturesomeness is a relative dimension, in that an individual has more or less of it than others. It was thus expected that each audience category will have varying levels of venturesomeness. Thus, the study expected that venturesomeness would facilitate discrimination between the audience categories.

Communication Behavior. Following from inherent personality traits is the communication behavior of an individual. Rogers (2003) has emphasized the importance of communication behavior with reference to innovation adoption. One of the communication behavior variables that has received a lot of attention in diffusion research is media usage (e.g. Bracken, Jeffres, Neuendorf, Kopfman & Moulla, 2005; Jeffres, Atkin, Bracken & Neuendorf, 2004; Leung & Wei, 1998). The extent of media usage varies across adopter categories (Rogers, 2003) with earlier adopters being more active users as compared to late adopters. Applying the same principle to this study, it was expected that Internet use will vary across categories of online video audience. Considering the different types of activities they engage in with online videos, the time they spend online should also be different. Thus, it was expected that Internet use will serve as another potential discriminating variable between audience categories.

Among other factors that have been associated with communication behavior, *cosmopoliteness* has received much attention in diffusion research and characteristics of adopter categories (e.g. Bracken et al., 2005; Jeffres et al., 2004; Rogers, 2003). Cosmopoliteness is defined as the degree to which an individual is oriented outside her own social system. Rogers (2003) notes that people who are more cosmopolite are earlier adopters of innovations. They are more likely to be stimulators of collective innovation-decisions – recognizing that a need exists and call attention to it in a social system.

Cosmopolite individuals are more likely to be outside, rather than within their system. They travel widely and are expected to have a great degree of interest in international issues, other cultures, and events occurring in other countries (Jeffres et al., 2004). Cosmopolites are more likely to identify with a broad and global culture than with a specific and narrow milieu (Sassen as cited in Jeffres et al., 2004). They are involved in matters beyond the boundaries of their own clique (see Ryan & Gross, 1943). They are members of the clique, but are oriented outside of it and are likely to have weak ties to other members of the network (Granovetter, 1973). This orientation frees them from the constraints of a clique and allows them the personal freedom to try out new ideas (Simmel as cited in Rogers, 2003).

With emerging new media and communication technologies, a multifaceted concept like cosmopoliteness helps better understand distinctive audience behaviors. Research shows that Internet use influences one's level of cosmopoliteness through unplanned exposure to websites outside one's social system orientation (Jeffres et al., 2004). It acts as an agent of cosmopoliteness cultivating an identification or interest in things outside one's system. Interpersonal networks of individuals contributing to the

viral spread of the video are more likely to be outside, rather than within, their system.

These individuals could be either initiators (people who start spreading the video) of or

contributors (people who forward the video after receiving it from someone) to the viral

process. Rogers (2003) has shown degree of cosmopoliteness to vary across the adopter

categories with early adopters being the most cosmopolite. Based on this, it was

concluded that cosmopoliteness could be another potential variable that would help in

discriminating the audience categories better.

Position in Social Networks. There are different spheres in which an individual's

position in a social network can be examined, for example, interpersonal, organizational,

inter-organizational, and so on. However, when it comes to viral videos, focus on an

individual's position in an interpersonal network is of prime importance. An individual's

personality variables and communication behavior have shown to affect her social

position and connectivity (Rogers, 2003). Position in network, also known as *network

connectedness*, has been identified as a variable that influences innovation adoption in

interpersonal networks (Wejnert, 2002). Network connectedness, defined as the degree to

which an individual is linked to others in the network, is inversely related to network size

(Freedman & Takeshita, 1969 as cited in Wejnert, 2002) but directly related to network

closeness, which is measured as number of friends and acquaintances within the network

(Coleman, Katz & Menzel, 1966 as cited in Rogers, 2003). Thus network connectedness

concerns not only an individual's own ties within the network but also the ties of the

people within the network. Coleman et al.'s study (as cited in Rogers, 2003) on drug

diffusion explains the above relationship. Their study showed that the increase in rate of

adoption and in the diffusion process occurred because of the interpersonal links between the doctors. In other words, the network connectedness of each doctor, provided communication avenues for exchange of subjective evaluations of the innovation. Other studies (e.g. Rosero-Bixby & Casterline, 1993; Ryan & Gross, 1943) have supported the above finding in that individuals with a high network connectedness have access to more people and hence are more likely to contribute to diffusion of the innovation. It followed from the above discussion that network connectedness could also be considered as a potential variable to discriminate between online video audience categories.

The following research question was formulated based on the above discussion:

RQ1a: What individual level characteristics best differentiate between

categories of online video audience?

Demographics

Besides individual-level characteristics, diffusion research has also highlighted the importance of demographics or socio-economic characteristics in the process of innovation adoption (Rogers, 2003). Atkin and Jeffres (1998) found that demographic variables have a strong influence on Internet adoption such that adopters are younger, better educated and have a higher income. Individual demographic factors such as age, sex, and education could then be employed in understanding the pattern of prediction of category membership.

The above discussion on audience characteristics – individual level and demographic – facilitated in proposing a model predicting passing along of the video further in the network. Findings from Pew Internet Research (2007) show that young

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adults in the age group 18-29 are among the most voracious online video viewers. However, there is no such finding which illustrates that young adults are the also the frequent forwarders of the video. Since there was no prior research on relationship between demographics and forwarding behavior of online video users, it was decided to investigate the pattern of prediction of demographics on audiences' forwarding behavior. Based on studies cited in the above discussion, it was expected that personality traits such as venturesomeness would be positively associated with audiences' forwarding behavior. Internet use would also be predictive of the forwarding behavior. Cosmopoliteness, which follows from Internet use, (Jeffres et al., 2004) would also contribute toward the forwarding behavior. Finally, based on literature which shows that network connectedness is positively associated with innovation diffusion (Ryan & Gross, 1943) it was expected that network connectedness would also predict the forwarding behavior of audience.

Each of these variables could have either a positive or a negative or no association with the forwarding behavior. However, since these variables are theoretically inter-related to one another in terms of causality and order, it was imperative to study the effect of these variables taken together, on audiences' forwarding behavior. This was done in order to investigate if the presence of any one variable undermines or influences that of another. The model depicted in Figure 1 demonstrating each audience characteristic as an antecedent to the propagation potential of the video was proposed.
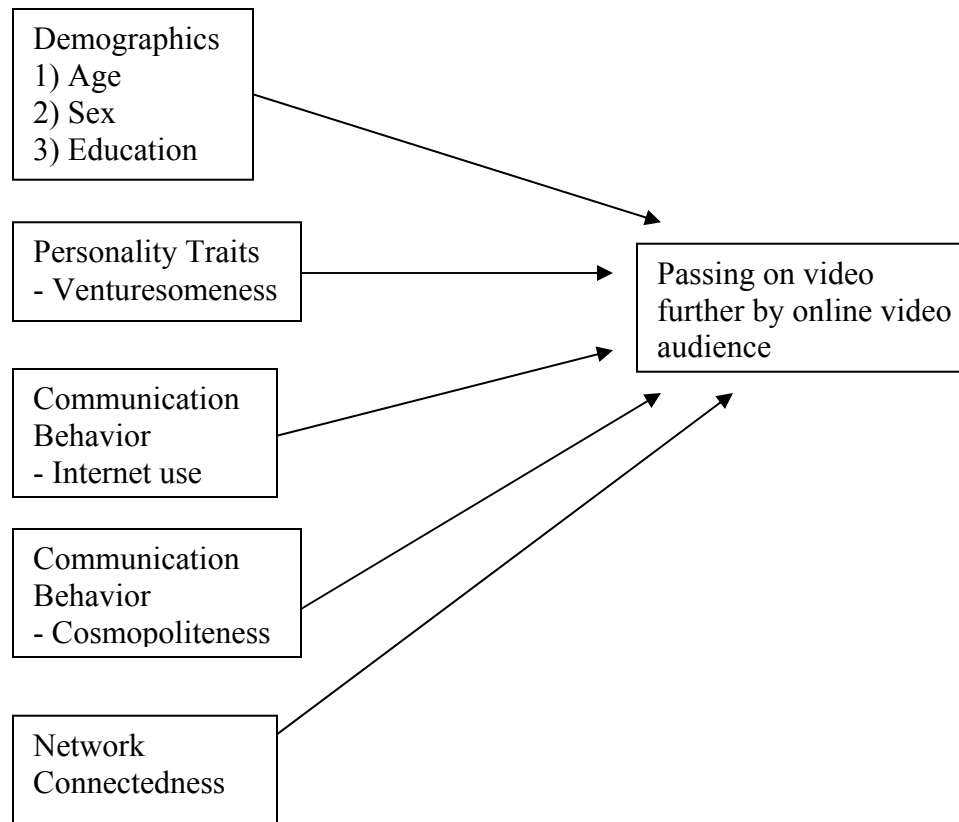
Figure 1. A model predicting video propagation in a network based on audience characteristics

Based on the above discussion and model, the following research question was offered:

RQ1b: How do audience characteristics relate to forwarding behavior of online

video audience?

Characteristics of the Innovation

Rogers (2003) has highlighted the importance of attributes of innovation in

predicting individual reactions toward it. In a similar vein, Wejnert (2002) emphasized

analysis of characteristics of the innovation under study. She showed innovation

consequences and its cost-benefit ratio as the two most important variables that

characterize any form of innovation. Rogers (2003) determined five attributes of the

innovation that are likely to affect its rate of adoption. These are *relative advantage, compatibility, complexity, trialability* and *observability*. Relative advantage is the degree to which an innovation is perceived as better than the idea it supersedes. Compatibility is the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters. Complexity is the degree to which an innovation is perceived as relatively difficult to understand and to use. Trialability is the degree to which an innovation may be experimented with on a limited basis. Observability is the degree to which the results of an innovation are visible to others. All of these attributes except complexity have a positive relationship with rate of adoption. Complexity, on the other hand, is negatively related to the innovation's rate of adoption.

Innovations for which these attributes were proposed were mostly concerned with issues of societal well-being (e.g. welfare and education policies, state laws) or were intended to improve individual lives and reform social structures (e.g. fertility control methods, new medical practices, improving technologies). As mentioned earlier, for this research, the spread of a piece of information or that of a video through a social network was viewed as the propagation of an innovation through the network. Thus, for the purpose of this study, an innovation was considered to be any new idea, thought or message that is propagated in the form of videos. Therefore, the characteristics of the innovation, in this study, were restricted to the content of the video.

Pew Internet Research (2007) group's study on online video audience reported that the web site YouTube is the primary source for online video viewing and sharing for 50% of online video audience. More than 60% of online video viewers prefer videos that are professionally produced (both for viewing and sharing) to those that have an amateur

content. Preference for content has been shown to vary with demographics (Pew Internet Research, 2007). For example, comedy and humorous videos attract young adults more than anyone else; men watch more music videos than women; animation and cartoons are more popular with young males; and political content is most popular in the age group 18-29. Since different content has different degree of popularity among different demographics, it could also be a possibility that the type of content governs the viewing and forwarding behavior of online video audience. An individual interested in politics is more likely to view a political content outline. She is also likely to forward it to a friend with similar interests. However, this pattern may change if the video content is different. This then led to the conclusion that content of the video could serve as a potential discriminating variable between the audience categories.

Based on these findings, it was proposed, as a starting point, to study videos featured by the category listings provided by YouTube. There are 12 different video content categories that are listed by YouTube: autos and vehicles, comedy, entertainment, film and animation, gadgets and games, how-to and DIY, music, news and politics, people and blogs, pets and animals, sports, and travel and places. Since some of these (e.g. comedy, entertainment, news and politics) seemed to overlap with each other, it was decided to study two mutually exclusive content categories, leaving no scope for confusion for respondents. The two categories selected for study were named *entertainment* and *information*. It was decided to define the two categories in a manner that would reflect the function of entertainment or information in a way the user herself perceives it to be. Thus, entertainment category was conceptualized as comprising videos that one would watch just for fun and that would bring pleasure and relaxation. For

example, clips from TV shows or movies, videos about political humor, funny videos, and so on. The main premise of entertainment category was that it did not consist of videos that the users thought had any kind of intent to make them learn. Information category was conceptualized as just the opposite; videos that people watch to learn; videos that pass on facts, data, and/or knowledge about something that the user perceives to be useful. For example news video clips, science/technology videos, and educational videos. Again, information was differentiated from entertainment by defining it as something the user would not watch only for fun.

The above discussion thus helped to come up with the second research question:

RQ2: How does video content differentiate between categories of online video audience?

Social and Environmental Context

A fundamental element of diffusion research is the recognition that innovations are not independent of the environment they diffuse in. Degree of homogeneity or heterogeneity in a group is related to innovation adoption (Wejnert, 2002). Local interactions and socialization between individuals lead to adoption of the innovation at the next higher level in the network. As individuals adopt the innovation, it starts diffusing through the network. Individuals' local social networks can have a major impact on the diffusion of an innovation. People will differ in a variety of ways that affect their decision of whether or not to adopt an innovation. From the social perspective, they might differ in terms of number of people with whom they interact, thus making the adoption of the innovation meaningful to certain individuals. A person's

behavior is heavily influenced by others with whom she is in contact on a regular basis. This means that the final outcome may result in several different proportions of the population eventually adopting the innovation. The eventual diffusion – the final percentage of the population that the innovation reaches – is dependent on several parameters, social structure being a very important one. The precise underlying social structure is important in terms of how the population reacts to the innovation. Beyond how many connections individuals have on an average, social structure also differs in terms of variations across individuals. Is it that everyone in the network knows twenty other people or do some know ten and others thirty? How different or similar is their behavior likely to be? How different or similar are they likely to be in terms of their background? Is it that within the twenty people an individual knows, some are frequent contacts while others are infrequent? As the settings change, different patterns emerge.

In the context of online viral transmission, this warrants an understanding of the relationships between individuals who are involved. This calls for applications of concepts from social networks such as strength of ties, homophily and heterophily.

Social Networks

Introduction and History

Study of social relationships among individuals or small groups is fundamental to the social sciences. Social network analysis may be defined as the disciplined inquiry into the patterning of relations among individuals or groups, as well as the patterning of relationships at different levels of analysis (Breiger, 2004). It is based on the notion that these patterns are important features of the lives of the individuals who display them. The

way an individual lives depends in large on how she is tied into the larger web of social connections.

Social networking dates back to anthropological studies of the effect of urbanization in Africa. The term itself was first coined by Barnes (1954) who studied social ties in a Norwegian fishing village, concluding that the whole of social life could be seen as a set of points, some of which are joined by lines to form a total network of relations. These insights were later extended by an American social scientist Jacob Moreno through development of a sociogram – a diagram of points and lines used to represent relations among persons (see Scott, 1991). Moreno used them to identify social leaders and isolates to uncover asymmetry and reciprocity in friendship choices and to map chains of indirect connections.

Relations in Networks

A social network is a structure made of individuals that are tied by one or more specific types of relations such as kinship, friendship, affection, cognition, values, ideas, finances and many more. Social network analysis views individuals and social relationships in terms of *nodes* and *ties*. Nodes are individuals within the network and ties are relationships between them. In its simplest form, a social network is a map of all the relevant ties between the nodes being studied. Many social theorists (e.g. Burt, 1980; Scott, 1991) have argued that individual attributes, important as they are in explaining human behavior, provide at best only a partial account when it comes to large-scale interactions. These theorists have argued that group and social phenomena are best understood by considering both attributes of individuals that make up the social system

and the relationships between them. Social network analysis thus produces a view where relationships and ties between individuals in the network are given importance. A relationship is not a property of the individual but a characteristic that is defined in reference to two or more individuals taken together. A network, then, is a structure that is built on the basis of such relationships. It is the regular pattern of person-to-person contact that can be identified as individuals exchange information in a human social system (Farace, Monge & Russell as cited in Monge, 1987).

All networks are constructed out of two elements: a set of individuals and one or more relations among them. The relations define the nature of the connections between the individuals. Many forms of relations can be used to study social networks. For example, a kinship relation could be that between a parent and child, between siblings or between husband and wife. An authority relation could be that between a boss and her subordinate. A resource relation could be that between employees who share resources of the employer.

Scientists and mathematicians have now built on these ideas, investigating ways in which people get jobs (Granovetter, 1974), new drugs get diffused through society (Coleman, Katz & Menzel as cited in Chaffee, 1975), social circles of elites are formed (Laumann a& Pappi, 1973), and diseases are transmitted through small-world networks (Moore & Newman, 2000). Similar research has also been conducted to understand the extent to which people work and find community on computer supported social networks (Wellman, Salaff, Dimitrova, Garton, Gulia & Haythornthwaite, 1996). Furthermore specific network analysis studies on computer mediated networks looked into dynamics of information diffusion through blogs (Gruhl, Guha, Liben-Nowell & Tomkins, 2004),

characteristics of social ties that influenced recipients' behavior in an online network (DeBruyn & Lilien, 2004), differences in sex in network development through text messaging (Igarashi, Takai & Yoshida, 2005), and recently how viral marketing and word-of-mouth communication contribute to aggregate operation of markets (e.g. Leskovec et al., 2007; Frenzen & Nakamoto, 1993).

Types of Networks

Burt (1980) notes that networks are of several types and should be analyzed differently. The different types of networks are: personal or ego networks, group networks, organizational networks, and inter-organizational networks. Ego networks are the communication linkages that people maintain with other individuals (Burt, 1980). These contacts may be extensive or limited and are likely to vary considerably from individual to individual. Group networks describe the patterns and structure of people who communicate more with each other than they do with the rest of the people in the larger network (Alba as cited in Monge, 1987). Organizational networks represent the structural differentiation of organizations. Inter-organizational networks are the configurations of communication relations between organizations (Lincoln as cited in Monge, 1987).

For this study it was decided that the most appropriate technique would be to look at ego networks in which the video travels from individual to individual. There is usually one individual in the network who initiates the process of spreading the video. The video then travels to other individuals who are essentially the initiator's acquaintances.

Identifying such individuals and understanding the relationships between them can help gain a better insight of the process of diffusion of the video.

Ego Networks

Ego networks consist of a focal node, known as the *ego*; the nodes to which the ego is directly connected, known as the *alters*; and the ties, if any, between the alters. Each alter in an ego network has its own ego network, and all ego networks interlock to form the entire social network. Egos and alters are tied to each other by social relations such as kinship, friendship, authority based, cognitive/affective (likes, knows, despises) or action/resource-based (talks to, sells to, shares with).

There has been a lot of debate on whether an ego network should be treated as composed only of those to whom the ego is tied directly, or should include the contacts of the ego, and/or others (see Epstein, 1969). Granovetter (1973) argues that by dividing an ego's network into that part made of close and direct ties on one hand, and that of distant and indirect ties on the other, both orientations can be dealt with. Ties in the former part should tend to be to people who know each other well while in the latter part, ego's contacts will not be necessarily tied to one another but surely to other individuals not tied to the ego. Thus, an ego can have a collection of close friends, most of who are in touch with one another – a densely knit clique. In addition, an ego can have a collection of acquaintances, few of who know one another. Each of these acquaintances, however, is likely to have close friends in her own right and therefore to have her own densely knit clique, but one different from that of the ego. Thus, a well-rounded ego network is likely to contain both weak and strong ties, and there are advantages to both.

The weak tie between an ego and her acquaintances is not merely a trivial acquaintance tie, but rather a crucial bridge between the two densely knit cliques of close friends. These cliques would not, in fact, be connected to one another at all were it not for the existence of weak ties. Weak ties provide access to new information because their contact with a different set of individuals gives them access to information sources different from their own (Granovetter, 1973). These ties serve a bridging function as they bring in new points of view. Weak ties tend to be more instrumental than strong ties, providing informational resources rather than support and exchange of confidence (Granovetter, 1982). In many instances, such as sharing videos online, a high level of intimacy is not required. This allows individuals to maintain their weak ties and still operate successfully.

Strong ties, on the other hand, provide frequent access to close others and easy and timely access to the information they have. The information is more freely given since close friends are motivated to share what they know (Granovetter, 1973, 1982). Strong ties convey trust and form the basis for the informal exchange of resources and favors (e.g. Uzzi, 1996). However, strong ties can limit an individual's access to new information.

Thus, different strengths of ties have different advantages to an individual in terms of access to information and support. It was then expected that an ego network would contain some weak ties, that are maintained infrequently and primarily associated with instrumental exchanges (e.g. passing on novel videos), and some strong ties, that are maintained frequently and involve multiple kinds of interactions (e.g. videos in which the alter is interested in).

Strength of Weak Ties

The notion of classifying network links on the basis of the degree to which they convey information was introduced by Granovetter's (1973) theory of the strength of weak ties. His research led to the conclusion that individuals get most of their information (e.g. information about job openings) from heterophilous individuals who were not very close friends. These *weak ties* occurred with individuals who were only marginally included in the current network of contacts, such as an old college friend, with whom sporadic contact had been maintained. Very few individuals got their information from close friends or relatives.

Why are weak ties so much more important than strong network links? This is because an individual's close friends seldom know much that the individual does not also know. One's intimate friends are usually friends of each other's, forming a close-knit clique. Such an ingrown system is an extremely poor net to catch new information from one's environment. Much more useful as a channel for gaining such information are an individual's more distant (weaker) acquaintances. They are more likely to possess information that the focal individual does not already possess, such as access to a new and/or innovative video. Weak ties connect an individual's small clique of intimate friends with another, distant clique. Thus, weak ties are often the bridge links (individuals who link two or more cliques in a system), connecting two or more cliques. If these weak ties were somehow removed from a system, the result would be an unconnected set of separate cliques, not a connected network. Even though weak ties are not a frequent path for the flow of messages, the information flowing through them can play a crucial role for individuals and for the whole network.

Granovetter (1973) defines the strength of a tie as "a probably linear combination of the amount of time, the emotional intensity, the intimacy (mutual confiding), and the reciprocal services which characterize the tie." Research studies have operationalized each of these components in varied ways (e.g. Brown & Reingen, 1987; Reingen & Kernan, 1986; Weenig & Midden, 1991). It was sufficient for the present research on viral videos to agree on a rough intuitive basis, whether a given tie is strong or weak.

Application of this theory to the present research would provide a promising explanation of how the video diffuses through the network. The idea here was to determine how strength of ties affected the diffusion pattern. For viral videos, the strength of weak ties arises from its important bridging function that allows the video to travel from one densely populated and cohesive clique to another similar cohesive clique. For example, in Figure 2, nodes A, B, C and D represent members of one cohesively bound group, while E, F and G represent those of another cohesive group.
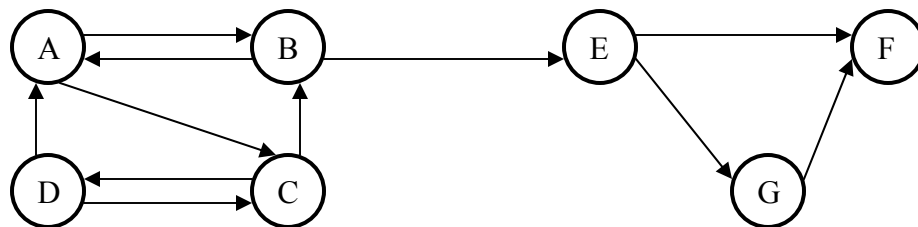
Figure 2: Network ties

The tie between B and E is one that represents a weak tie in the network through which the video can be passed on from one group to the other. If weak ties did not exist, a system would consist of disjointed cliques, inhibiting the widespread diffusion of information and thus prohibiting the viral effect of the video. Weak ties, therefore, are

important in examining how interaction at the dyadic or group level aggregates to form a large-scale pattern.

The conclusions that were derived from the above discussion were that the video can reach a large number of people and traverse greater social distances when passed through weak ties rather than strong. If an individual watches a video and passes it on to all his close friends, and they do likewise, many will receive the video a second and a third time, since those linked by strong ties tend to share friends. If the motivation to spread the video is dampened a bit on each wave of re-forwarding, then the video moving through strong ties is much more likely to be limited to a few cliques than that moving through weak ones. Based on past research and the discussion above, it was expected that weak ties would facilitate the diffusion of the video in the network. Thus, the first set of hypotheses was proposed:

> H1a: Weak ties are more likely than strong ties to contribute toward the viral
> effect resulting by watching the video.

> H1b: Weak ties are more likely than strong ties to contribute toward the viral
> effect resulting by forwarding the video.

Homophily and Heterophily

The concept of *homophily* was introduced by Lazarsfeld and Merton (1964). It says that most human communication will occur between individuals who are alike (i.e. homophilous and have a common frame of reference). Homophily is defined as "the degree to which a pair of individuals who communicate are similar" (Rogers, p. 305). It could be either demographic (observed) or perceived similarity. Demographic homophily

may be defined as similarity in terms of sex, race, occupation, education, socioeconomic status, and many more factors pertaining to an individual's background. On the other hand, perceived homophily concerns an individual's perception of how similar he or she is to another person (McCroskey, Richmond & Daly, 1975). It may be defined as similarity in terms of attitude, behavior, and thoughts. When two individuals share common background (demographic homophily) or common meanings, beliefs and mutual understandings (perceived homophily), communication between them is more likely to be effective. Individuals enjoy the comfort of interacting with others who are similar. Interacting with individuals who are markedly different requires more effort to make communication effective.

Homophily and effective communication breed one another. The more communication there is between two individuals, the more likely they are to become homophilous. The more homophilous two individuals are, the more likely that communication between them will be effective. Individuals who depart from the homophily principle and attempt to communicate with others who are different from them often face the frustration of ineffective communication. Differences in technical competence, social status, beliefs, and language lead to mistakes in meaning, thereby causing messages to be distorted.

Heterophily, the opposite of homophily, is the degree to which pairs of individuals who interact are different in certain attributes (Rogers, 2003). Heterophilous communication between dissimilar individuals may lead to cognitive dissonance because an individual is exposed to messages that are inconsistent with her existing beliefs, resulting in an uncomfortable psychological state. However, it also has certain

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advantages in terms of information exchange potential. Heterophilous links often connect two cliques in a network, thus spanning two sets of dissimilar individuals in a system. These heterophilous links are especially important in conveying information about innovations in a network

Unlike other scholars, Brown and Reingen (1987) have treated tie strength and homophily as two separate but related constructs. They argue that homophily refers to the similarity in attributes possessed by individuals in a relation, whereas tie strength is a relational property that manifests itself in different types of social relations varying in strength. This can be related to Granovetter's (1973) theory of strength of weak ties. He suggests that the stronger the tie connecting two individuals, the more similar they tend to be. So, homophilous communication may be frequent and easy, but may not be as crucial as less frequent heterophilous communication in diffusing innovations. Homophily accelerates the process but limits the diffusion to those individuals connected in a close-knit clique.

Based on this, one would expect that the more heterophilous two individuals are, the more likely the video is to travel further in the network; the significance being that heterophilous communication facilitates flow of information between diverse groups leading to an aggregate. In other words, the more homophily in the network, the less likely the video is to diffuse. This then led to the second set of hypotheses:

H2a: Demographic heterophilous ties are more likely than demographic homophilous ties to contribute toward the viral effect resulting by viewing the video.

H2b: Demographic heterophilous ties are more likely than demographic homophilous ties to contribute toward the viral effect resulting by forwarding the video.

H2c: Perceived heterophilous ties are more likely than perceived homophilous ties to contribute toward the viral effect resulting by viewing the video.

H2d: Perceived heterophilous ties are more likely than perceived homophilous ties to contribute toward the viral effect resulting by forwarding the video.

CHAPTER III

METHODOLOGY

Meyer (2004) points out that the methodology of Ryan and Gross (1943) has dominated diffusion research. He also discusses diffusion methodology that has been characterized by the collection of quantitative data and proposed alternative methodological approaches to broaden the diffusion knowledge base. Alternatives discussed include panel studies, longitudinal studies, point-of-adoption studies, use of archival records, and integrated qualitative methods.

Studies on the comparison of Web-based versus traditional pencil-and-paper-based surveys provide some valuable insights. The Web certainly provides a convenient way of doing research with special populations that regularly use the Internet (Couper, Traugott & Lamias, 2001). Cobanoglu, Warde & Moreo (2001) discuss several advantages of using web-based surveys which include cost savings associated with eliminating the printing and mailing of a survey instrument, increased numbers of surveys that can be transmitted in minutes, faster completion by respondents, and automatic coding of responses for the researcher (as opposed to manual coding).

Some studies (e.g. Cavusgil & Elvey-Kirk, 1998; Kaplowitz, Hadlock & Levine, 2004) investigate the difference in response rates between Web-based and mail surveys. Differences in response rates between these two types of survey methodologies could be due to less time devoted to motivating tools to increase online survey responses compared to tools used in mail surveys such as personalized letters and incentives. Brawner, Felder, Allen, Brent and Miller (2001) note that the reason Web surveys are so attractive is that they allow for automatic tabulation and analysis of responses; but the additional effort they require of respondents could lead to a drop in response rates. However, Kaplowitz et al. (2004) discuss that Web-based surveys are capable of achieving a response rate similar to that of mail surveys when given advance mail notifications.

Participants

Findings from Pew Internet Research (2007) show that young adults in the age group 18-29 are among the most voracious online video viewers. A poll conducted by Harris Interactive in January 2007 revealed that 85% of YouTube users constitute the traditional college student demographics. Since there is no other empirical research on viral videos or its users, it was proposed here to look at college students in the same age group as a starting point. As such, the population for this research comprised college students in the age group 18-29 at a Midwestern urban university in the United States of America. A sample of 270 such users (egos) was recruited through a random sampling method.

Procedure

Since this research was on online videos that get transmitted over the Web and since the sample consisted primarily of college students, it was decided to use a Web-based survey methodology. This decision was also taken to eliminate the need to mail the response back to the researcher and to reduce the cost of distributing the survey to participants. The data from a Web survey would be obtained in a format that was compatible with SPSS.

The study used QUASK – an online survey tool. Communication instructors at the university agreed to give extra credit to students to participate in the research. Once the concepts and measures in the survey were finalized, the next step was to fill out the research protocol application for Cleveland State University's Institutional Review Board (IRB) for their consent. The completed application forms were sent to IRB and approval (see Appendix B) was received through mail.

The survey was uploaded on to the server so that its URL could be documented and provided to participants. The URL for the survey was http://www.computerwranglers.com/viralvideos.htm. Once uploaded, the web link to the survey was e-mailed to the instructors who then passed it on in their respective classes. The survey link was kept active for four weeks after which the data was downloaded and analyzed. The last survey was completed on November 19, 2007 and the survey was made inaccessible thereafter.

Survey Instrument

The survey instrument was a questionnaire that was administered online. There were different sections in the survey looking into audience categorization, audience characteristics, video content, network level properties, and finally viral effect of video (see Appendix A).

Research Question 1a (RQ1a)

Based on the discussion about the two concepts, online video audience categories and their individual level characteristics, the first research question was:

RQ1a: What characteristics best differentiate between categories of online video audience?

Online video audience categories

Based on individuals' viewing and forwarding behavior, four categories were generated. These were 1) Initiators, 2) Viewers who forward, 3) Viewers who do not forward, and 4) Non-viewers. Respondents were classified into these four categories based on their answer to the question 1 in the survey instrument (see Appendix A): Which of the following statements best describes you?

1. I actively seek out for videos on web sites and then share them with my friends and acquaintances.

2. I usually watch videos my friends and acquaintances share with me and forward them on.

3. I usually watch videos my friends and acquaintances share with me but rarely forward them on

4. I rarely watch videos my friends and acquaintances share with me.

Audience characteristics

Venturesomeness. Different categories of online video audience were expected to have varying levels of venturesomeness – the highest being associated with innovators/initiators (Rogers, 2003). Question 15 in the survey instrument (see Appendix A) had items measuring willingness to take risks, openness to novel ideas and concepts and self-confidence. The response scale ranged from 1 through 5, where 1 was coded as "strongly disagree" and 5 was coded as "strongly agree." Questions such as "I like to experiment," "I like to explore new technologies," "I trust my own judgment," and similar others were asked (see Bearden, Hardesty & Rose, 2001).

Internet use. Internet use was measured in question 17 (see Appendix A) by asking participants the number of hours per week they use the Internet. Response scale ranged from 1 = 0 hours; 2 = 1-5 hours; 3 = 6-10 hours; 4 = 11-15 hours; 5 = 16-20 hours and 6 = 21 or more hours.

Cosmopoliteness. Cosmopoliteness is defined as the degree to which an individual is oriented outside her own social clique (Rogers, 2003). Question 16 in the survey instrument (see Appendix A) had items measuring diversity of interpersonal

communication network and interest in different cultures. Respondents were asked to use a 1-5 scale (where 1 was coded "strongly disagree" and 5 was coded "strongly agree") to tell how much they agreed with three items, one focusing on communication with people from different backgrounds, another focusing on how people see themselves as international citizens, and the third emphasizing awareness of events around the world. Further, they were asked to use the same scale to rate three additional items to rate their interest in travel to different countries, current events in other countries, and other cultures. Responses to each of these items were summed up to get an overall cosmopoliteness score (see Bracken et al., 2005; Jeffres et al. 2004).

Network Connectedness. By definition, network connectedness is the degree to which an individual is linked to others in the network. As discussed earlier, it is inversely related to network size but directly related to network closeness. Based on this, network connectedness was operationalized as a ratio of network closeness over network size. In other words, it is a ratio of the number of those individuals that know each other over the number of individuals an ego is connected with in the network. It was decided to test the impact of this variable on both processes – receiving the video and forwarding the video. Respondents were asked questions 4a, 5a, 9a and 10a (see Appendix A) that measured network size:

- On an average how many other people are likely to share the video with you?
- On an average how many other people are you likely to forward it to?

These questions were followed by questions 4b, 5b, 9b and 10b (see Appendix A) measuring closeness

- How many of these people are likely to know each other?

The ratio was used as a continuous variable for discrimination between the audience categories.

Analysis

A stepwise discriminant analysis was conducted to determine the answer to RQ1a. Audience category was treated as the grouping variable and individual level audience characteristics (venturesomeness, Internet use, cosmopoliteness and network connectedness) were the discriminating variables.

Research Question 1b (RQ1b)

The next research question looking at all audience characteristics together and trying to predict forwarding behavior of the audience was:

RQ1b: How do audience characteristics relate to forwarding behavior of online video audience?

Apart from individual level characteristics, the operationalization of which was discussed above, this research question also accounted for demographic characteristics of the users. Participants were asked questions on basic demographic characteristics such as age, sex, and education. Forwarding behavior of the audience was already measured as part of the audience categories.

Analysis

Multiple linear regression using blocks of independent variables – demographics (age, sex, education), personality traits (venturesomeness), communication behavior I

(Internet use), communication behavior II (cosmopoliteness), and position in social networks (network connectedness) and dependent variable (online video audience category) was conducted.

<p style="text-align:center">Research Question 2 (RQ2)</p>

The second research question was

RQ2: How does video content differentiate between categories of online video audience?

Online Video Content

Two content categories – entertainment videos and informational videos were selected for this section of the questionnaire. The descriptions for these categories were:

Entertainment - Think about videos that are meant for fun, pleasure or relaxation. They could be funny videos, clips from TV shows or movies, or videos about political humor. These videos are NOT the ones that you think are intended for you to learn something. They are something you would watch only for entertainment.

Information - Think about videos that are meant for learning. These videos are the ones that pass on knowledge about an issue you think is useful and/or important. They could be news video clips, educational videos or

science/technology videos. They are NOT the ones that you would watch just for

fun and pleasure. They are something you would watch to gain information.

Respondents were asked to rate similar sets of items in questions 3 and 8 (see Appendix A) for each of the video contents under study. Questions asked them, on a scale of 1 through 5 where 1 meant "never" and 5 meant "almost always," about the frequency of actively seeking out the video, that of viewing the video when friends or acquaintances shared it, and that of sharing the video with others.

Analysis

Again, to determine the answer to RQ2, a set of discriminant analysis were conducted with audience category as the grouping variable and video content as the discriminating variable.

Hypotheses 1a and 1b (H1a and H1b)

Looking at the strength of ties between individuals in the network and their contribution toward viral effect of the video, the first set of hypotheses were

H1a: Weak ties are more likely than strong ties to contribute toward the viral effect resulting by watching the video.

H1b: Weak ties are more likely than strong ties to contribute toward the viral effect resulting by forwarding the video.

Strength of Ties

Strength of ties was measured on a dichotomous scale (questions 6, 7, 11 and 12 in Appendix A) as that with a close friend (strong) and that with an acquaintance (weak).

Viral Effect

As discussed earlier, for this study, viral effect was conceptualized in two ways – one for viewing the video and the other for forwarding the video. Hence, it was operationalized as a continuous variable that measured the likelihood of a) opening a video when it was shared with the respondents and b) forwarding the video to other members of the network (see questions 6, 7, 11 and 12 in Appendix A). A Likert's scale of 1-5 was used where 1 meant "not at all" and 5 meant "a lot."

Analysis

Hypotheses 1a and 1b were tested by using paired samples t-tests using strength of ties (strong versus weak) as the independent variable and viral effect of the video (viewing and forwarding) as the dependent variable.

Hypotheses 2a, 2b, 2c and 2d (H2a, H2b, H2c and H2d)

Finally, to test the difference in contribution between types of ties toward viral effect of the video, the second hypothesis proposed was

H2a: Demographic heterophilous ties are more likely than demographic homophilous ties to contribute toward the viral effect resulting by viewing the video.

H2b: Demographic heterophilous ties are more likely than demographic homophilous ties to contribute toward the viral effect resulting by forwarding the video.

H2c: Perceived heterophilous ties are more likely than perceived homophilous ties to contribute toward the viral effect resulting by viewing the video.

H2d: Perceived heterophilous ties are more likely than perceived homophilous ties to contribute toward the viral effect resulting by forwarding the video.

Types of ties

Two types of ties – homophilous and heterophilous – were conceptualized. Homophilous ties were similar to one another while heterophilous ties were different. These concepts were measured in question 13 (see Appendix A) based on diversity in terms of socio-demographic variables such as age, ethnicity, education, occupation, and sex. Respondents were asked how similar they thought they were to the person who shared videos with them the most. A trichotomous scale of 1-3 was used, where 1 meant "yes," 2 meant "no" and 3 meant "Don't know." This measure was then recoded into a new dichotomous variable consisting of two groups – homophily and heterophily.

This was followed by question 14 (see Appendix A) that measured perceived homophily. Respondents were asked to rate level of similarity with the person who shared videos with them the most. Items used were "thinks like me," "behaves like me," "sees the world in a similar way," "is similar to me." A Likert's scale of strongly disagree (1) to strongly agree (5) was used.

Analysis

Hypotheses 2a and 2b were tested using independent sample t-tests with type of tie (homophilous versus heterophilous) as the independent variable and viral effect of video (viewing and forwarding) as the dependent variable. Hypotheses 2c and 2d were tested using bivariate correlation statistics between viral effect (viewing and forwarding) and perceived homophily.

CHAPTER IV

RESULTS

Sample

A total of 270 undergraduate and graduate students responded to the online survey out of which 268 responses were usable. The gender split in the sample was 173 (64.6%) females and 92 (34.3%) males. Three participants who completed the survey did not provide an answer.

Frequency analyses of the data showed that almost 66% of the respondents were in the age bracket 19-24; 12% each were under 19 and in the age group 25-30; 7.5% were between 31 and 40; and 3% were of age 41 or more. The mean age of the sample was 23.

About 91% of the participants were single; 6% were married and the rest were either separated or divorced. The sample consisted predominantly of working students. More than 50% of participants in the sample were employed, either full time or part time. More than 64% of the respondents had some kind of college or university degree; 19% were high school graduates; 15% were some college or university graduate and a very minuscule 0.7% were masters level graduates.

Almost 72% of the sample reported to be White/Caucasian, 14% reported to be African Americans, while the rest were distributed between other races such as Hispanic, Asian, Asian American and/or mixed.

Table 1 shows the demographic profile for the sample.

Table 1

Demographic Characteristics

Sex	%	Age	%	Marital Status	%	Education	%	Race	%
Male	34.3	Under 19	11.9	Single	91.4	High school graduate	19.3	White	71.6
Female	64.6	19-24	65.7	Married	6.4	Some College or University	65.2	African American	13.8
		25-30	11.9	Separated/ Divorced	2.3	College/University graduate	14.8	Asian	2.99
		31-40	7.5			Masters level graduate	0.76	Hispanic	3.36
		41-50	2.2					Mixed	3.36
		51+	0.8					Other	3.73

Characteristics of online video audience

The research question related to online video audience and their individual level characteristics was

RQ1a: What individual level characteristics best differentiate between categories of online video audience?

The break-up of online video audience category (see Table 1 in Appendix C) by the four groups was: 1) Initiators (9.7%); 2) Viewers who forward (23.5%); 3) Viewers who do not forward (38.8%), and 4) Non-viewers (28%). Individual level characteristics of audience were measured in terms of venturesomeness, communication behavior and network connectedness.

Venturesomeness

Questions measuring venturesomeness ranged across three dimensions – willingness to take risks, novelty-seeking, and self-confidence. The scale used was 1 (strongly disagree) through 5 (strongly agree). A factor analysis was run on SPSS to confirm the three dimensions mentioned above. Varimax rotation was specified to identify variables that might indicate potential dimensions, and factor loadings were examined at 0.5 and above on each dimension. Three factors with eigen values greater than 1 were asked for, and the scree plot (see Fig. 1 in Appendix D) confirmed the same. The factor analysis resulted in three factors – novelty-seeking characteristics, self confidence, and willingness to take risk – explaining a total of 50.4% of the variance. Table 2 summarizes the factor analysis and the venturesomeness dimensions. Items loading at 0.5 or above are highlighted in bold for each dimension.

Table 2

Factor Loadings for Venturesomeness Dimensions

	Venturesomeness Dimensions		
Factor I: Novelty-seeking characteristics	I	II	III
I like to try new ideas at work and in life	**0.76**	0.14	0.10
I like a great deal of variety	**0.72**	0.09	0.13
I like to experiment	**0.68**	-0.05	0.30
I like new styles and different things	**0.66**	0.11	0.10
I look at the situation from a different angle	**0.59**	0.14	-0.38
I like to explore new technologies	**0.58**	0.11	0.02
I like an exciting, stimulating and active life	**0.58**	0.09	0.24
Factor II: Self-confidence			
I know the right questions to ask before making decisions	0.16	**0.76**	0.09
I am confident in my abilities to make decisions	0.20	**0.73**	-0.20
I trust my own judgment	0.16	**0.71**	0.03
Too often the decisions I make are not satisfying (rev. coded)	-0.03	**0.60**	0.07
Factor III: Willingness to take risks			
I don't like to take chances if I don't have to (rev. coded)	0.29	0.01	**0.73**
I feel the tried and true ways of doing things are the best (rev. coded)	0.22	-0.13	**0.67**
I am hesitant to complain when a problem arises (rev. coded)	-0.03	0.32	**0.53**
Final Eigen Values	3.23	2.18	1.64
Variance Explained (%)	27.10	13.77	9.56
Cronbach's Alpha	0.79	0.70	0.68

The first factor, *novelty-seeking characteristics* accounted for 27% of the explained variance. It consisted of 7 items with a high reliability level of 0.79. The second factor, *self-confidence* explained almost 14% of the total variance and had a reliability of 0.7 with four items in it. The last and final factor, *willingness to take risks* explained 9.5% of the variance. It consisted of only three items. Compared to the first two, the third factor had a lower reliability at 0.68.

The scores for these three factors were then computed by averaging the scores of individual items that constituted the factor. Self-confidence had the highest mean score ($M = 3.74$, $SD = 0.66$), followed by novelty-seeking characteristics ($M = 3.61$, $SD = 0.68$), and finally followed by willingness to take risks ($M = 3.18$, $SD = 0.76$).

Communication Behavior

Internet use. Participants were asked the average number of hours per week they use Internet. The descriptive statistics for Internet use (see Table 57 in Appendix C) indicated that a total of 47% of the participants spent between 1 and 10 hours on the Internet per week. 15% used the Internet for 11-15 hours per week, and 19% each for 16-20 and more than 21 hours per week. The mean value for Internet use was 3.88 indicating that the average use of Internet for the sample was somewhere between 11 and 20 hours per week.

Cosmopoliteness. Questions measuring cosmopoliteness ranged across two dimensions – diversity of interpersonal communication network and interest in different cultures. The scale used was 1 through 5 where 1 was coded as "strongly disagree" and 5 was coded as "strongly agree." A factor analysis was run on SPSS to confirm the two

dimensions mentioned above. Varimax rotation was specified to identify variables that might indicate potential dimensions, and factor loadings were examined at 0.5 and above on each dimension. Table 3 below summarizes the factor analysis.

Table 3

Factor Loadings for Overall Cosmopoliteness

	Overall Cosmopoliteness
I am interested in current events in other countries	0.82
I enjoy learning about different cultures	0.76
I think of myself as a citizen of the world	0.68
I enjoy traveling to different countries	0.68
I am more aware of what is going on around the world than my friends	0.61
I communicate with people from a wide variety of backgrounds and cultures	0.60
Final Eigen Value	2.89
Variance Explained (%)	48.20
Cronbach's Alpha	0.78

Literature (Bracken et al. 2005; Jeffres et al., 2004) shows the presence of two distinct factors – international focus and cosmopolitan communication and attitude - for the variables used. However, the factor analysis in this case resulted in a single factor, with eigen value 2.89, explaining 48% of the variance. The total items constituting the factor were 6. The factor was named *overall cosmopoliteness* and had a high reliability at 0.78. The factor score was computed as an overall additive score for the 6 items.

Network Connectedness

Network connectedness, defined as the degree to which an individual is linked to others in the network, was measured as a ratio of network closeness over network size. Network connectedness was measured for both processes – opening and forwarding of the video - for two categories of video contents – entertainment and information. Thus, there were four types of connectedness:

1) Network connectedness for opening an entertainment video (NC_{eo})

2) Network connectedness for forwarding an entertainment video (NC_{ef})

3) Network connectedness for opening an informational video (NC_{io}) and

4) Network connectedness for forwarding an informational video (NC_{if}).

The values ranged between 0 and 1 where 0 indicated lowest value for connectedness and 1 indicated highest. Table 4 gives the descriptive statistics for the network connectedness variables.

Bi-variate correlation analyses between these four network connectedness variables resulted in significant correlations (see Table 58 in Appendix C). The highest correlation was seen between NC_{io} and NC_{if} ($r = 0.56$, $p \leq .001$) and the lowest

Table 4

Descriptive Statistics - Network Connectedness

	N	Mean	SD
Network connectedness-Entertainment-Opening (NCeo)	247	0.72	0.38
Network connectedness-Entertainment-Forwarding (NCef)	188	0.74	0.37
Network connectedness-Information-Opening (NCio)	195	0.69	0.41
Network connectedness-Information-Reception (NCif)	155	0.74	0.40

correlation was seen between NC_{eo} and NC_{ef} ($r = 0.39$; $p \leq .001$). A total measure was

computed by averaging out the four different connectedness measures and was named

overall network connectedness.

Result of Research Question 1a (RQ1a)

Since the first research question tried to answer which characteristics serve as

differentiators between audience categories, a stepwise discriminant analysis procedure

was employed. The discriminant analysis was conducted using online video audience

category as the grouping variable and novelty-seeking characteristics, self-confidence,

willingness to take risks, Internet use, overall cosmopoliteness and overall network

connectedness as the discriminating variables. Since the first category – initiators – had a

very small number of respondents, it was decided to combine the categories and then

study the differences. The discriminant analysis intended to look at differences between

audience categories in terms of participation and non-participation in the viral process.

Thus, the first three categories - initiators, viewers who forward, and viewers who do not

forward - were combined into one category representing *participants* while non-viewers

represented *non-participants*. Results of the two group stepwise discriminant analysis are

presented in Table 5.

Before the discriminant analysis was conducted, the two groups – participants and

non-participants - were tested to see if they were homogenous or not. The Box's M test

for homogeneity of co-variances between the two groups showed that the significance of

differences was 0.11 thus implying that the two groups were homogenous in their co-

variances. The discriminant analysis resulted in two variables that contribute significantly

to the discrimination between the two groups. These were overall network connectedness and novelty-seeking characteristics.

Table 5

Online Video Audience discriminated by Audience Characteristics

			Wilk's λ	
Step	Variables	Function	F	p
1	Overall network connectedness	0.73	9.73	0.01
2	Novelty seeking characteristics	0.60	6.54	0.01
	Internet use*	0.35	2.15	0.14
	Willingness to take risks*	0.30	1.58	0.21
	Self confidence*	0.16	0.48	0.49
	Overall cosmopoliteness*	0.15	0.43	0.51

Note. Box's $M = 30.01$, $F = 1.38$, $p = .114$;

Eigenvalue $= 0.07$, $r_c = 0.25$, Wilk's $\lambda = 0.93$, $\chi^2 = 17.28$, $p < .05$

* Variables not included in the function

Since there were two groups: participants and non-participants, one discriminant function was derived from the analysis. The discriminant function derived was statistically significant with a multivariate Wilks' λ value of 0.93. A chi-square statistic, which was 17.28 (6, N=268, $p < .05$) was used to assess the statistical significance. The eigenvalue for the function was 0.07. The canonical correlation between the function and all the predictor variables was 0.26 (See Table 5). The square of canonical correlation was 0.07 which meant that a mere 7% of the variance was explained. The discriminant function was successful in classifying 60.4% of the original cases correctly. The

functions at group centroids resulted in scores of 0.17 and –0.42 for participants and non-participants respectively. It can be seen from the structure coefficients of the discriminating variables presented in Table 5 that the two significant variables are positively related with the function.

The significant function derived from the discriminant analysis reflects two main differences between participants and non-participants: Participants have a higher degree of overall network connectedness as compared to non-participants; participants strongly agree that they possess novelty-seeking characteristics, while non-participants strongly disagree about the same. This implies that individuals who participate in the viral process of videos online have a large number of people (friends, family or acquaintances) within their network, and most of the members in the network are likely to know each other. Also, individuals who participate in the viral process are more interested in new and novel ideas. This search for novelty leads them out of a local circle of peer networks into more diverse social networks, which in turn aides in the diffusion of the video.

Result of Research Question 1b (RQ1b)

RQ1b intended to understand the combined effect of all audience characteristics – individual level and demographics – on the forwarding behavior of online video audience. It was worded:

RQ1b: How do audience characteristics relate to forwarding behavior of online

video audience?

The categories of online video audience were created based on their viewing and forwarding behaviors. Since RQ1b concentrated only on the forwarding behavior, the

four audience categories were collapsed into two – one which engaged in passing on videos further in the network and the other which did not. This is analogous to recommendations in a word-of-mouth communication process. Thus, initiators and viewers who forward were combined into one category representing *recommenders*, and viewers who do not forward and non-viewers were combined to represent *non-recommenders*. These new categories – recommenders and non-recommenders were coded 1 and 0 respectively.

A hierarchical multiple regression was conducted using four blocks of independent variables: demographics, personality traits, communication behavior and network connectedness, in that order. Demographic characteristics comprised age, sex and education. Factors derived from venturesomeness – novelty-seeking characteristics, self confidence and willingness to take risks - were used as variables in the personality traits block. Communication behavior was entered in two separate blocks, Internet use followed by overall cosmopoliteness, based on their causal relationship. Finally, overall network connectedness was entered as the fourth block. In a preliminary analysis, bi-variate zero-order Pearson correlation coefficients between the independent and the dependent variables were generated. Table 6 gives results for the bi-variate zero-order correlations between audience category and audience characteristics.

The results revealed that there are five significant and four insignificant correlations between audience category and audience characteristics. The variables that had a significant correlation with audience category were – age, sex, novelty-seeking characteristics, Internet use and overall network connectedness. It can be seen that age and audience category are negatively related indicating that recommenders are younger in

Table 6

Zero Order Correlations between Audience Category and Audience Characteristics

	Audience Category
Demographics	
Age	-0.16**
Sex	0.23***
Education	-0.08
Venturesomeness	
Novelty-seeking characteristics	0.11*
Self confidence	0.03
Willingness to take risks	0.07
Communication behavior	
Internet use	0.17**
Overall cosmopoliteness	0.06
Overall network connectedness	0.28***

Note. $* p \leq .05; ** p \leq .01; *** p \leq .001$

age than non- recommenders. Most recommenders also tend to be males and strongly agree that they possess novelty-seeking characteristics. They are heavy users of the Internet and have a high degree of connectedness in the network.

Table 7 presents the results of the hierarchical multiple regression. Model 1 in the regression included the three demographic variables. Model 2 was the demographic variables plus the venturesomeness dimensions. Model 3 contained demographics, venturesomeness dimensions, and Internet use. Model 4 was all of the above with overall

Table 7

Multiple Regression Analysis for Audience Characteristics Predicting Audience's Forwarding Behavior

	β_{in} (1)	β_{in} (2)	β_{in} (3)	β_{in} (4)	β_{in} (5)
Block I : Demographics					
Age	-0.16*	-0.17*	-0.18**	-0.18**	-0.17**
Sex	0.23***	0.23***	0.22***	0.23***	0.23***
Education	0.02	0.01	0.02	0.01	0.01
F	7.06***				
df	3,252				
R	0.28***				
R square	0.08***				
Incremental R square	0.08***				
Block II: Venturesomeness					
Novelty-seeking characteristics		0.10	0.06	0.04	0.04
Self confidence		0.01	0.02	0.02	0.02
Willingness to take risks		0.07	0.08	0.08	0.09
F		4.46***			
df		6,249			
R		0.31			
R square		0.10			
Incremental R square		0.02			

Note. * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

Table 7

	β_{in} (1)	β_{in} (2)	β_{in} (3)	β_{in} (4)	β_{in} (5)
Block III: Internet use			0.14*	0.15*	0.14*
F			4.64***		
df			7,248		
R			0.34*		
R square			0.12*		
Incremental R square			0.02*		
Block IV: Overall cosmopoliteness				0.05	0.03
F				4.13***	
df				8,247	
R				0.34	
R square				0.12	
Incremental R square				0.00	
Block V: Overall network connectedness					0.28***
F					6.64***
df					9,246
R					0.44***
R square					0.20***
Incremental R square					0.08***
Final R square					0.20***

Note. * p ≤ 0.05; ** p ≤ 0.01; *** p ≤ 0.001

cosmopoliteness added. And finally, model 5 included all of the above variables plus overall network connectedness.

The results reveal that age, sex, Internet use and overall network connectedness are the significant predictors of audience's forwarding behavior. Overall, 19.5% variance is explained by the model with demographics and overall network connectedness contributing the maximum, 7.8% each. Final standardized beta values for the significant demographic characteristics are -0.17 and 0.23 for age and sex respectively. Age appeared in the bivariate zero order correlations to be negatively associated with predicting forwarding behavior of audience. The same relationship was observed in the presence of other factors as well. Thus, younger generation is likely to engage in passing on videos more as compared to older generation. In the same vein, the relationship between sex and audience category was seen to be positive in both cases. It was concluded that the likelihood of men passing on videos further in their network is higher than that of women.

Novelty-seeking characteristics appeared to be positively associated with audience category in the bivariate analysis. However, it was not significant in predicting the dependent variable when all other variables were included in the analysis. Final standardized beta value for Internet use is 0.14 indicating a positive association with forwarding behavior. The preliminary bivariate analysis also showed a similar association supporting the argument that usage of Internet encourages users' forwarding activities. Thus, people who are heavy users of the Internet are more likely to engage in passing on videos further in the network. The final standardized beta value for overall network connectedness is 0.28 which again confirmed its positive association with the dependent

variable. It thus implied that people having a high degree of connectedness in the network tend to forward videos more than people with a low degree of connectedness. An important observation made here was that demographics (age, sex) and Internet use did not lose their significance in predicting forwarding behavior until the very end when overall network connectedness was added. Thus, even though overall network connectedness may seem to be an overpowering variable among all, due to its correlation and beta coefficients, it is not the only one predicting audience behavior.

<div align="center">Characteristics of the Innovation</div>

The research question related to innovation-level characteristics was

RQ2: How does video content differentiate between categories of online video
audience?

Result of Research Question 2 (RQ2)

Online video audience category was the same as that used for RQ1. There were four groups to start with – initiators, viewers who forward, viewers who do not forward, and non-viewers. Video content was measured in terms of frequency of actively seeking, viewing, and sharing two categories of video clips – entertainment and information. Table 8 gives the descriptive statistics and reliability coefficients of the variables related to video content.

A series of discriminant analyses was conducted using online video audience category as the grouping variable and frequencies of actively seeking, viewing and sharing two types of video content – entertainment and information – as the independent

Table 8

Descriptive Statistics and Reliability Coefficients for Video Content

	N	Mean	SD		N	Mean	SD
Entertainment				Information			
Frequency of actively seeking out video	268	2.64	1.20	Frequency of actively seeking out video	268	2.38	1.10
Frequency of viewing video when shared	268	3.64	1.24	Frequency of viewing video when shared	267	2.91	1.30
Frequency of sharing video	268	2.51	1.16	Frequency of sharing video	268	2.23	1.04
Cronbach's Alpha = 0.76				Cronbach's Alpha = 0.73			

variables. Similar to RQ1a, the first analysis intended to look at differences between audience categories in terms of participation and non-participation in the viral process. Initiators, viewers who forward, and viewers who do not forward were combined into one category representing participants while non-viewers represented non-participants. Results of the two group discriminant analysis are presented in Table 9.

Before the discriminant analysis was conducted, the two groups – participants and non-participants - were tested to see if they were homogenous or not. The Box's M test for homogeneity of co-variances between the two groups showed that the significance of differences was 0.21 thus implying that the two groups were homogenous in their co-variances. The discriminant analysis resulted in four variables that contribute significantly to the discrimination between the two groups. These were frequency of

Table 9

Online Video Audience discriminated by Video Content – I

		Wilk's λ	
Variables	Function	F	p
Frequency – Viewing entertainment video	0.96	121.17	0.01
Frequency - Sharing entertainment video	0.62	51.08	0.01
Frequency – Actively seeking entertainment video	0.43	24.53	0.01
Frequency – Viewing informational video	0.34	15.54	0.01
Frequency – Actively seeking informational video	-0.01	0.02	0.09
Frequency - Sharing informational video	0.12	1.90	0.17

Note. Box's $M = 26.79$, $F = 1.23$, significance =.21;

Eigenvalue = 0.49, $r_c = 0.57$, Wilk's λ = 0.67, $\chi^2 = 105.2$, $p \leq .001$

viewing entertainment video when shared by friends and acquaintances, frequency of

sharing an entertainment video with others, frequency of actively seeking out an

entertainment video on web sites, and frequency of viewing an informational video when

shared.

Since there were two groups: participants and non-participants, one discriminant

function was derived from the analysis. The discriminant function derived was

statistically significant with a multivariate Wilks' λ value of 0.67. A chi-square statistic,

which was 105.2 (6, N=267, $p \leq .001$) was used to assess the statistical significance. The

eigenvalue for the function was 0.49. The canonical correlation between the function and

all the predictor variables was 0.57 (See Table 9). The square of canonical correlation

was 0.33 which meant that around 33% of the variance was explained. The discriminant

function was successful in classifying 75.7% of the original cases correctly. The functions at group centroids resulted in scores of 0.43 and -1.13 for participants and non-participants respectively. It can be seen from the structure coefficients of the discriminating variables presented in Table 9 that the four significant variables are positively related with the function.

The significant function derived from the discriminant analysis reflects some important differences between participants and non-participants. When compared with non-participants -

1) Participants almost always view entertainment videos.

2) Participants almost always share entertainment videos

3) Participants almost always actively seek out entertainment videos

4) Participants almost always view informational videos.

However, as compared to entertainment videos, informational videos fail in explaining any kind of differences between the two categories. Also, within the entertainment category, viewing entertainment video clips turned out to be the most important differentiator. This implies that individuals who participate in the viral process of videos online appreciate entertainment as a content genre. However, when it comes to activities related to the genre, they are more likely to prefer just watching such content when their friends and/or acquaintances share it with them. They are less likely to engage in passing the video further in the network and lesser likely to consciously look for it on a web site. The likelihood of viewing an informational video when shared by friends is the least of all. In other words, participants of viral videos are entertainment viewers.

The second discriminant analysis intended to look at differences between audience categories in terms of sharing of the videos. Since this is analogous to recommendations in a word-of-mouth communication process, initiators and viewers who forward were combined into one category representing recommenders; and viewers who do not forward and non-viewers were combined to represent non-recommenders. Results of the second discriminant analysis are presented in Table 10.

The Box's M test for homogeneity of co-variances between the two groups showed that the significance of differences was 0.03. The extremely sensitive nature of the test makes this an acceptable level thus implying that the covariance matrices between the two groups formed by the grouping variable do not differ.

Table 10

Online Video Audience discriminated by Video Content – II

		Wilk's λ	
Variables	Function	*F*	*p*
Frequency - Sharing entertainment video	0.94	151.14	0.01
Frequency - Actively seeking entertainment video	0.65	71.92	0.01
Frequency - Viewing entertainment video	0.50	42.30	0.01
Frequency - Viewing informational video	0.23	8.70	0.01
Frequency - Sharing informational video	0.21	7.72	0.01
Frequency - Actively seeking informational video	0.10	1.80	0.18

Note. Box's $M = 35.32$, $F = 1.63$, significance $= .03$;

Eigenvalue $= 0.65$, $r_c = 0.63$, Wilk's $\lambda = 0.61$, $\chi^2 = 131.3$, $p \le .01$

The results of the discriminant analysis between recommenders and no-recommenders were quite similar to those between participants and non-participants. However, one additional variable was found to be contributing significantly toward the discrimination between the two groups, and it was frequency of sharing an informational video with others.

The discriminant function derived was statistically significant with a multivariate Wilks' λ value of 0.61; a significant chi-square statistic, which was 131.3 (6, N=267, $p \leq$ .001); and an eigenvalue of 0.65. The canonical correlation between the function and all the predictor variables was 0.63, explaining 39.4% of the variance. 83.1% of the total cases were classified correctly by the discriminant function. The functions at group centroids resulted in scores of 1.14 and -0.57 for recommenders and non-recommenders respectively. It can be seen from the structure coefficients of the discriminating variables presented in Table 10 that the variables are all positively related with the function.

Similar to preferences of participants, recommenders are more inclined toward the entertainment genre. However, the activity of forwarding such video clips is predominant. Another important conclusion can be derived from the significant contribution of informational video content. Recommenders are likely to view an informational video almost always while non-recommenders are not; recommenders are also likely to pass on an informational video further almost always while non-recommenders are not. This implies that recommenders are interested in the information genre of videos, though to a much lesser extent than the entertainment genre. But they are not inclined to actively look for it on web sites.

The third discriminant analysis in this series intended to investigate the differences within the participants category. As such, initiators, viewers who forward and viewers who do not forward were treated as three different categories, all participating in the viral process but differing in their activities. Results of the third discriminant analysis are presented in Table 11. The table presents two discriminant functions. The first function is statistically significant, as Wilk's lambda emerged with strong statistical significance, indicated by a large chi-square and a strong canonical correlation [Wilk's λ = 0.60, χ^2 (12, N = 268) = 97.05, r_c = 0.63, eigenvalue = 0.64, $p \leq .001$] and explains 39.4% of the total variance. It contains the following significant

Table 11

Online Video Audience discriminated by Video Content – III

	Function		Wilk's λ	
Variables	I	II	*F*	*p*
Frequency - Sharing entertainment video	0.91	-0.25	50.57	0.01
Frequency - Actively seeking entertainment video	0.63	0.53	24.74	0.01
Frequency - Viewing entertainment video	0.26	0.05	4.23	0.01
Frequency - Sharing informational video	-0.22	0.59	3.65	0.03
Frequency - Actively seeking informational video	0.15	0.48	1.78	0.17
Frequency - Viewing informational video	0.12	0.42	1.32	0.27

Note. Box's *M* = 45.42, *F* = 1.01, significance = .45;

Function 1: Eigenvalue = 0.64, r_c = 0.62, Wilk's λ = 0.60, χ^2 = 97.05, $p \leq .001$

Function 2: Eigenvalue = 0.02, r_c = 0.15, Wilk's λ = 0.98, χ^2 = 4.31, $p \leq .51$

predictors: frequency of sharing an entertainment video ($p \leq .001$), frequency of actively seeking entertainment video ($p \leq .001$), frequency of viewing entertainment video ($p \leq .05$), and frequency of sharing informational video ($p \leq 0.05$). By comparison, the second function is statistically insignificant, as Wilk's lambda did not attain statistical significance and the level of canonical correlation stood at a weak 0.15 [Wilk's $\lambda = 0.98$, χ^2 (5, N = 268) = 4.31, r_c = 0.15, eigenvalue = 0.02, $p \leq .51$). The analysis succeeded in classifying 63.2% of the original cases correctly.

The functions at group centroids for the first discriminant function resulted in scores of 0.85, 0.86 and -0.73 for initiators, viewers who forward and viewers who do not forward respectively. Thus, the function really discriminated between the forwarding activities within participants. It can be concluded from the results that viewers who forward are almost always likely to pass an entertainment video further in the network, while viewers who do not forward are never likely to do so. However, viewers who forward are never likely to pass an informational video further; but viewers who do not forward are somewhat likely to do so. Thus it was seen here that both genres played a role in distinguishing between the audiences in their own ways. Viewers, who forward videos, do it purely for fun and hence are more inclined toward the entertainment genre. On the other hand viewers, who do not forward videos, are a bit more serious and value information more than fun. They usually do not engage in sharing but will do so if the video has some informational value.

Strength of ties

The two hypotheses based on the strength of ties theory were

H1a: Weak ties are more likely than strong ties to contribute toward the viral

effect resulting by watching the video.

H1b: Weak ties are more likely than strong ties to contribute toward the viral

effect resulting by forwarding the video.

Strength of ties was measured on a dichotomous scale as that with a close friend

(strong) and that with an acquaintance (weak). Viral effect was measured for two

processes – viewing and forwarding. Viral effect for viewing the video was an additive

measure of likelihood of opening both entertainment and informational videos. Since the

likelihood of opening the video was measured for both strong and weak ties on the same

set of subjects, each subject had two observations – likelihood of opening with strong tie

and likelihood of opening with weak tie. Different subjects may have different

likelihoods of opening the video, so a paired analysis was thought of being appropriate to

test H1a. The objective was to investigate whether a difference in strength of ties changes

the likelihood of opening the video within the same group of people. Table 12 shows

results of the paired samples t-test for H1a.

The mean value for viral effect for viewing caused due to strong ties was 7.99 and

that cause due to weak ties was 5.15. The t-test showed a mean difference of 2.84 which

was significant [$t(265) = 21.79$, $p \leq .001$]. However, the result was in a direction opposite

to that hypothesized. As compared to weak ties, strong ties resulted in a higher

contribution toward the viral effect resulting by viewing the video.

Table 12

Mean values for Video Viewing - Strong versus Weak ties

	Viral effect of viewing-Strong ties	Viral effect of viewing-Weak ties
Sample Size	266	266
Mean	7.99	5.15
Standard deviation	2.22	2.16
Paired Samples t-test		
Mean difference		2.84
t		21.79***
df		265

Note. *** p ≤ 0.001

The viral effect resulting by forwarding the video was also an additive measure of likelihood of forwarding entertainment and informational videos. A paired samples t-test was run to test H1b the results of which are shown in Table 13.

The mean value for viral effect for forwarding caused due to strong ties was 6.23 and that cause due to weak ties was 3.92. The t-test showed a mean difference of 2.84 which was statistically significant [$t(256) = 18.33, p \le .001$]. Similar to H1a, results obtained for H1b were also in a direction opposite to what was predicted. Strong ties contributed more than weak ties toward viral effect resulting by forwarding the video.

Table 13

Mean values for Video forwarding - Strong versus Weak ties

	Viral effect of forwarding- Strong ties	Viral effect of forwarding- Weak ties
Sample Size	257	257
Mean	6.23	3.92
Standard deviation	2.51	1.97
Paired Samples t-test		
Mean difference		2.31
t		18.33***
df		256

Note. *** $p \leq 0.001$

Types of ties

The two hypotheses based on demographic ties were:

H2a: Demographic heterophilous ties are more likely than demographic

homophilous ties to contribute toward the viral effect resulting by viewing the

video.

H2b: Demographic heterophilous ties are more likely than demographic

homophilous ties to contribute toward the viral effect resulting by forwarding the

video.

The demographic homophily scale comprised five items that measured similarity in

terms of age, ethnicity, education, occupation, and sex. The scale had an acceptable

reliability coefficient of 0.74. The individual items were added to get a total measure of demographic homophily that had a mean of 9.05. The final demographic homophily measure was then recoded such that all values below the mean were labeled "1" denoting homophily and those above the mean were labeled "2" denoting heterophily.

Hypothesis H2a was tested employing independent samples t-test with the recoded demographic homophily measure as the independent variable and viral effect by viewing as the dependent variable. Thus, there were two groups – demographic homophilous ties (represented as 1) and demographic heterophilous ties (represented as 2). Table 14 shows the descriptive statistics for demographic ties for viewing the video and table 15 shows the results obtained from the t-test for H2a.

The descriptive statistics for the two groups in Table 14 show that the mean for demographic homophilous ties is slightly higher than that for demographic heterophilous

Table 14

Descriptive Statistics for Demographic Ties- Video Viewing

Group	N	Mean value for viral effect - viewing	SD
Homophilous ties	184	13.41	3.69
Heterophilous ties	81	12.49	4.12

ties. The Levene's test is not significant meaning the two groups have approximately equal variance on the dependent variable. The results of the t-test assuming equal variances for the groups show that the mean difference of 0.91 between the two groups is not significant [$t(263) = 1.79, p > 0.05$].

Table 15

Mean Values for Video Viewing - Demographic Homophily versus Heterophily

		Viral effect - Viewing	
		Equal variances assumed	Equal variances not assumed
Levene's test for equality of variances	*F*	1.60	
	p	0.21	
t-test for equality of means	*t*	1.79	1.72
	df	263	139
	p	0.07	0.09
	Mean difference	0.91	0.91

This means that there is not much distinction made between demographic ties when it comes to viewing a shared video. Thus, no support was found for H2a. Although, the results are not statistically significant at the 0.05 level, they seem to be approaching significance. An interesting observation was made in these results. The mean values for the two groups shows that the mean for homophilous ties is higher than that for heterophilous ties; a trend opposite in the direction that was predicted.

An independent samples t-test was again run to test H2b. Independent variables were demographic homophilous and demographic heterophilous ties and the dependent variable was viral effect by forwarding. Table 16 shows descriptive statistics for demographic ties for forwarding the video and table 17 gives results from the t-test for H2b.

Table 16

Descriptive Statistics for Demographic ties- Video forwarding

Group	N	Mean value for viral effect - forwarding	SD
Homophilous ties	178	10.17	4.02
Heterophilous ties	78	10.06	4.08

It was again seen that results obtained from the t-test were not statistically significant [$t(254) = 0.19, p > 0.05$]. No support was established for H2b either. Thus, no conclusion could be made regarding differences between people with similar and dissimilar demographic characteristics tending to engage in exchange of videos.

Table 17

Mean Values for Video Forwarding - Demographic Homophily versus Heterophily

		Viral effect - Forwarding	
		Equal variances assumed	Equal variances not assumed
Levene's test for equality of variances	*F*	0.02	
	p	0.89	
t-test for equality of means	*t*	0.19	0.19
	df	254	145
	p	0.85	0.85
	Mean difference	0.10	0.10

As a means to cross-check the findings for H2a and H2b, bivariate correlations were run between the original continuous measure of demographic ties and viral effect by viewing and forwarding. Demographic ties and viral effect by viewing had a significant negative correlation ($r = -.23, p \leq .01$). Similar negative correlation existed between demographic ties and viral effect by forwarding ($r = -.11, p \leq .01$). The results reveal a similar trend in that demographic homophilous ties contributed more toward viral effect than demographic heterophilous ties. Thus, people having a similar background and demographic characteristics tended to engage in exchange of videos more than people with dissimilar demographic profile.

The next analysis was to test the two hypotheses based on perceived ties. The hypotheses were:

H2c: Perceived heterophilous ties are more likely than perceived homophilous ties to contribute toward the viral effect resulting by viewing the video.

H2d: Perceived heterophilous ties are more likely than perceived homophilous ties to contribute toward the viral effect resulting by forwarding the video.

The perceived homophily scale comprised four items that measured similarity in terms of thoughts, behavior, view of the world, and overall personality. The scale had an acceptable reliability coefficient of 0.86. The individual items were added to get a final total measure of perceived homophily that had a mean of 13.44. A low score denoted heterophilous ties while a high score denoted homophilous ties.

H2c was tested by running bi-variate correlation between perceived homophily measure and viral effect by viewing. The analysis resulted in a positive correlation coefficient of 0.21 which was statistically significant ($r = 0.21, p \leq 0.01$]. Correlation

coefficients for testing H2c are shown below in Table 18. However, the positive

association again showed a trend that was in a direction opposite to what was predicted.

Thus, no support was found for H2c.

Table 18

Bivariate Correlations - Perceived Ties and Video Viewing

		Perceived homophily
	r	0.21
Viral effect - Video viewing	p	0.01
	N	266

Similar bivariate correlations between perceived homophily measure and viral

effect by forwarding were run to test H2d. The correlation coefficient was a low 0.13

which was statistically significant [$r = 0.13$, $p < 0.05$].

Table 19

Bivariate Correlations - Perceived Ties and Video Forwarding

		Perceived homophily
	r	0.13
Viral effect - Video forwarding	p	0.03
	N	257

Table 19 shows the results of the bi-variate correlation for testing H2d. Again, the

positive correlation negated the direction of predicted relationship and no support was

established for H2d. This led to the interpretation that online users are more likely to

engage in video sending and reception with people who they perceive to be similar to them in terms of lifestyle, attitudes and values.

CHAPTER V

DISCUSSION

This exploratory research study examined viral video users from a social-science perspective, moving beyond the hype of the most popular viral videos to looking more closely at the users themselves. Using an online survey of 270 students at a Midwestern urban university, it was proposed to look at online video audience from the perspective of diffusion of innovations (Rogers, 2003) as the theoretical frame. Drawing from Rogers' (2003) classification of adopter categories, four different categories of online video audience - based on their viewing and forwarding activities – were proposed. An attempt was made to create a typology of users by distinguishing between these four categories by analyzing the audience characteristics and the activities with two different video contents – entertainment and information. A model exploring antecedents of viral transmission was developed and tested. Additional investigation on viral transmission of video was done by applying social network concepts such as strength and types of ties to the diffusion model. Table 20 summarizes the research questions and hypotheses and their respective results.

Table 20

Summary of Results

Research Questions/Hypothesis	Analysis	Result	Conclusion
RQ1a: What individual level characteristics best differentiate between categories of online video audience?	Stepwise Discriminant Analysis	Significant discriminant function consisting of overall network connectedness and novelty-seeking characteristics	Participants are highly connected and are novelty-seekers.
RQ1b: How do audience characteristics relate to forwarding behavior of online video audience?	Multiple Regression	Model consisted of overall network connectedness, sex, age, and Internet use	Viral transmitters are more likely to be highly connected young males, who use the Internet a lot.
RQ2: How does video content differentiate between categories of online video audience?	Set of Discriminant Analyses	Significant discriminant function	Participants prefer viewing entertainment, recommenders prefer sharing entertainment, non-recommenders tend to share information.

Table 20 Contd.

H1a: Weak ties are more likely than strong ties to contribute toward the viral effect resulting by watching the video.	Paired Samples t-test	Not supported. Significant difference but in opposite direction.	Strong ties are more effective than weak ties due to trust and credibility issues.
H1b: Weak ties are more likely than strong ties to contribute toward the viral effect resulting by forwarding the video.	Paired Samples t-test	Not supported. Significant difference but in opposite direction.	Strong ties are more effective than weak ties due to trust and credibility issues.
H2a: Demographic heterophilous ties are more likely than demographic homophilous ties to contribute toward the viral effect resulting by viewing the video.	Independent samples t-test	Not supported. Relationship opposite to predicted.	Homophily is more effective than heterophily in online viral communication due to similarity in needs and wants.
H2b: Demographic heterophilous ties are more likely than demographic homophilous ties to contribute toward the viral effect resulting by forwarding the video.	Independent samples t-test	Not supported. Relationship opposite to predicted.	Homophily is more effective than heterophily in online viral communication due to similarity in needs and wants

Table 20 Contd.

H2c: Perceived heterophilous ties are more likely than perceived homophilous ties to contribute toward the viral effect resulting by viewing the video.	Bivariate correlation	Not supported. Very low positive correlation.	Homophily is more effective than heterophily in online viral communication due to similarity in preferences.
H2d: Perceived heterophilous ties are more likely than perceived homophilous ties to contribute toward the viral effect resulting by forwarding the video.	Bivariate correlation	Not supported. Very low positive correlation.	Homophily is more effective than heterophily in online viral communication due to similarity in preferences.

Overall, the results provide some important insights on the online video audience. The value of this current study is that it examines a gap in the research by investigating users of a very popular but understudied medium. If online videos are to be used for commercial viral marketing purposes, knowledge of the users' characteristics, their engagement with different types of video content, and their relations and perceptions about others in the network may result in a more successful endeavor.

Differences Between Audiences based on their Characteristics

The investigation for this research began with looking at two broad categories within the online video audience – those who participate in a video going viral over the web and those who do not participate in the same. The primary differences between these two groups were seen in terms of their connectedness in the network and their novelty-seeking behavior. The emergence of network connectedness here as an important differentiator suggests viewing the network as an important source of information and cues for behavior and action for users. It provides a useful lens to examine interpersonal influences that are the hallmark of viral processes. The more the number of ties within a group and the more the number of people knowing each other in a group, the more active is the process of communication that goes on within it (Festinger, Schacter & Back as cited in Burt, 1980).

Influences in viral advertising or marketing occur in computer mediated settings and are significantly different from those occurring in conventional contexts. A high degree of network connectedness for online practices implies a considerably large scale and scope of influence. The process of viewing and passing on videos, being computer enabled, allows a much larger number of individuals to be connected. Besides personal interest and utility, some of the possible reasons for participating in the viral process through viewing the video could be driven by desires related to network connectedness. These desires could be either identifying as a member of the group or relationship maintenance with the sender. Participation in the viral process by forwarding a video also seems to be governed by network connectedness. The effort expended in forwarding it on to all acquaintances in the network is only marginally higher than sending it to just one

person. Thus, on an average, the reach of individuals, or the number of connected others that can be influenced increases considerably. Further, this reduction in effort needed to reach out to others increases the number of occasions when users act on their natural impulse to share videos they think might be useful or interesting to others in their network. Together, this results in an enormous increase in the extent of participation in the viral process through viewing and forwarding videos in online media.

Viral marketers can take advantage of connectedness of individuals in a network to propagate influences regarding a product or service. Network connectedness can be of critical interest to marketers in deciding if it is worth expending time and effort on acquiring a potential customer. For example, if, in addition to viewing an advertisement video of a product online, the viewer influences three other people to view it by forwarding it to them, the reach of the advertisement has effectively quadrupled and the marketer is then justified in spending more on acquiring the first viewer. If, however, the same viewer does not know any other person who might be interested in the video and tends to watch it all by herself, acquiring her may be a waste of resources. There may be other factors worth considering simultaneously with network connectedness. First, the interest level of the viewer in the product or service being advertised is important. Attempts to acquire customers with a high connectedness but with no interest in the product/service being advertised should be avoided. Second, it is worth spending effort on a customer who is connected to many others, who in turn have a high degree of connectedness. This would ensure the viral spread of the video in the true sense. Clearly, network connectedness then serves as a very important element in making optimal viral marketing decisions.

The second difference that stood out was that people who participate in viral processes possess a novelty seeking behavior. Novelty seeking is a personality trait characterized by a tendency toward excitement in response to new experiences and engagement in sensation-seeking behavior. The desire to seek something new, the satisfaction of finding something new, and sharing these new findings with others are the key characteristics of novelty seeking individuals. As compared to non-participants, there is an increased motivation among viral video participants to seek out new ideas and messages, and then share them with others. In other words, participants are much more likely than non-participants to try something new. Perhaps some of the appeal for participation in viral process can be explained by the fact that online videos are unusual or novel. Besides, online videos sometimes also provide varied virtual environment that satisfies the novelty seeking needs of individuals. Therefore, high novelty seeking characteristics may predispose an individual to participating in the viral process.

Drawing from the above discussion, it can be concluded that novelty propels propagation of a video, but as it fades the speed of propagation decreases. For businesses engaging in viral marketing practices, this finding implies that in order to gain customers their online experience must continue to develop to provide fresh and new ideas or messages. People are attracted to things they have never seen before, especially if they are over-the-top in some obvious way. Participants in the viral process, being prone to seeking novelty, have the ability to grasp the essence of such a new concept, which then will have a much better chance of spreading.

Factors Predicting Likelihood of Viral Transmission

This research also investigated the combined effect of all audience characteristics – individual and demographic – on audience category in the context of passing along videos further in the network. The study developed and tested a theoretical model accounting for audience characteristics as the antecedents of video forwarding. By measuring the underlying concept of video forwarding in terms of two distinct audience categories of recommenders and non-recommenders, this research discovered relationships between the antecedents and video forwarding behavior. Some findings in the model test replicated the existing literature on diffusion research. The results demonstrated that men who are predominantly in the age group 18-25 are more likely to pass along videos further than their female and older counterparts. This is similar to many other findings in adoption of innovations, especially new media, where adopters have primarily been young male adults (e.g. Atkin & Jeffres, 1998; Ivory 2006; Wei, 2001).

Findings from Pew Internet Research (2007) support the above results in that younger viewers express more interest in sharing what they find. They also share videos with a higher frequency than older viewers. In other words, they are considered to be the most contagious carriers in the viral spread of online video. However, findings from Pew Internet Research (2007) did not find any significant differences between viewing and forwarding of online videos in terms of sex of the user such that men and women were found to be equally effective in the viral spread. The model employed in this research found that age and sex play important roles in predicting forwarding behavior of audience. However, reliance on demographic characteristics only, for segmenting the audience for the purpose of viral marketing may not be the wisest strategy with the

evolving Web 2.0 phenomena. It is quite likely that online videos being one of the forms of Web 2.0 and its applications, the demographics are likely to change with time. Demographics then should be studied in conjunction with other behavioral characteristics to be able to arrive at an optimal segmentation strategy.

The results demonstrated that Internet use is a predictor of audience's forwarding behavior. Heavier users of Internet are more likely to pass along the video further. The sample for this research comprised primarily of college students who spend a reasonable amount of time on the Internet using it as a venue for social interaction – a place where they can share creations, tell stories, and interact with others (Pew Internet Research, 2007). Viral spread of online videos is facilitated through a variety of tools such as instant messaging, blogging, chat rooms, and discussion forums. Thus, Internet usage appeared to play an important role in explaining audience's forwarding behavior.

Finally, network connectedness, among all other variables, emerged as the most significant predictor of audience's forwarding behavior. As mentioned earlier, network connectedness and nature of online communication together facilitate the viral spread of a video. For online businesses, this means identifying and utilizing people with high degrees of network connectedness. Working through such individuals speeds up the viral spread. Targeting customers with a small network size where not many people know each other slows down the diffusion rate. When enough pass-alongs have occurred, the rate of viral spread increases and the *critical mass*, an important element in diffusion, occurs (Rogers, 2003). The conclusion derived is that no matter how the connected users are identified or acquired, or precisely how they influence others by forwarding the video,

the network connectedness strategy generally has robust effects in continuing the diffusion process.

Surprisingly, the model failed to establish any impact of users' personality traits (novelty-seeking behavior, self-confidence, and willingness to take risks) on their video forwarding behavior. Although novelty seeking behavior was a strong predictor of participation in the viral process, no such relationship was identified for novelty seeking with video forwarding behavior. This then leads to the conclusion that those who are open to new experiences will be more likely to view new ideas through online videos, but not to sharing them with others. This might be due partly to the nature of online communication which enables users to seek a myriad of information with no interpersonal pressure or social constraints, which in turn automatically enhance the novelty seeking characteristics. However, sharing the video with others has to be ensured with the thought that the video is equally new, novel and exciting for the recipient.

Self-confidence has been shown to be positively related to adoption of innovations, especially technological applications. One reason to explain the absence of relationship between self-confidence and forwarding behavior could be the medium of travel of viral videos. The sample used for this study, being primarily college students, has been growing up with the Internet and its usage for communication with their friends is a natural part of their world. Thus, even though they might be self-confident, it has hardly got anything to do with their online behavior. A similar explanation could be given for absence of the third personality trait – willingness to take risks – in the model.

No relationship was established between audience's forwarding behavior and their cosmopoliteness. A possible reason is that cosmopoliteness might not have a direct

impact on forwarding behavior but might have an indirect effect mediated through

Internet use or network connectedness. Another explanation could be that having a

cosmopolitan attitude does not influence the online activities of users. A cosmopolitan

attitude implies geographical and cultural awareness and orientation. Having a

cosmopolite communication attitude does not necessarily transfer into online interaction

which may or may not be cosmopolite in nature. Forwarding a video to a member in the

network is not governed by whether the recipient is culturally or geographically different

from the sender.

Differences Between Audiences based on Content

Moving on with investigating audience categories with respect to the video

content, the first difference that stood out was among the two content genres that were

used for this study. Entertainment genre was found to be more appealing all throughout.

Those who participate in the viral video process were found to be more attracted toward

entertaining and funny video clips. Informational video content had a very low

contribution toward explaining any kind of difference between the two groups. It can thus

be concluded that audiences are much more receptive to being entertained, not just

informed. However, informing customers is imperative for marketers to sell their product.

Videos that try to sell products and ideas by including a commercial or promotional

content, including a sales pitch/message can be plain and pure information for the

audience which they are not always interested in. That said, there is still a role for this

medium in spreading advertiser's value proposition and infecting the audience. The

question advertisers/marketers can then ask themselves is, "How does the audience get

entertained out of the information delivered?" Passing on information to audience that is packaged in an entertaining way seems to be the answer. Many successful viral campaigns have leveraged the power of humor to sell their ideas. Although humor is pervasive on the Internet, viral ads need not necessarily be *humorous* to be entertaining. They have to be unique and effective enough to engage the audience. One of the possible ways of doing this is by using interactive elements in the ads. Thus, plain information that can be boring or even complex can make perfect sense and be interesting when presented in an entertaining way.

Further, looking at activities engaged in with entertaining video content, it was found that individuals are interested in simply watching the content when they receive it from their friends or family members. The likelihood of searching for a funny video clip on their own and that of sharing an entertainment clip with someone else is much less. Thus, it was concluded that individuals participating in the viral process are more interested in *watching* entertainment than *sharing* it. While this finding still classifies such individuals as contributing to the viral process, they can be termed as *silent contributors* since their main focus is simply watching the video. This difference here between participants and non-participants in terms of entertainment viewing may be a very important one in trying to understand the online video audience better. An important implication of this finding could be the social nature of online video viewing. It is likely that social motivation – the desire to view videos with family or friends – has influenced the way users experience online video. It is likely that online video participants are not exclusively confined to watching videos alone at their computer but prefer watching them

with others. However, since social desire and motivation was not assessed by the study, no decisive evidence can be offered at this time.

The research also tried to look closely at the differences between people who pass on the video further and thus keep the viral process continuing (recommenders) and those who do not pass on the video further (non-recommenders). Although some level of acceptance for information genre was found here, that for entertainment genre was predominant again. Another finding was that recommenders who tend to engage in passing the video further were more inclined to do so if they found the content of the video to be entertaining.

One reason to explain why the preference for entertainment genre was more than that for information genre may have to do with the university student sample used. The sample under investigation consisted of young adults with a mean age of 23 who are naturally more attracted toward being entertained online. Survey findings from Pew Internet Research (2007) also reveal a similar trend. For young adults in the age group 18-29, comedy is a bigger draw among all kinds of online video content. More than 50% of internet users in the above age group reported that they watch humorous videos (Pew Internet Research, 2007). Any visit to video sharing web sites such as YouTube does yield links to featured or popular videos meant to inspire a laugh.

The above two findings on entertainment viewing and sharing combined together can be an important insight for commercial viral advertising campaigns. The question for many marketers and advertisers is how to take advantage of the video opportunity for the sake of their own marketing objectives and goals and explore the potential of online videos to be used as viral advertisements. The success of most online ad campaigns is

tracked by measuring the number of times the video has been viewed. Online marketers are naturally more interested in driving targeted traffic. Thus, the ideal target in such a case would be the subset of recommenders within participants. The viewing and passing-on of the video has to gain momentum at every stage for the video to spread like a virus. Marketers can use video clips to advertise their products to millions very inexpensively if the content is funny, entertaining and provocative enough for people to watch and then send it to their friends and colleagues.

Finally the differences within the participants of the viral video process were studied. As described earlier, the three groups – initiators, viewers who forward, and viewers who do not forward – contribute to the viral phenomenon in their own ways. The first two groups are more *active* in their contribution by engaging both in viewing and forwarding while the third group comprises *silent* contributors who engage simply in watching. An important distinction between the active and the silent groups here was the fact that even though silent contributors are less likely to engage in forwarding videos, their chances of doing so increase if the content of the video is informative. These silent contributors have a preference over the utilitarian and informative value of a video rather than its entertaining value. They probably participate in the process for a fair exchange of ideas and value authentic and honest information more than anything else. This again indicates that viral ads need not always be humorous to be unique. An attempt by marketers to build a sustainable relationship with users can prove to be rewarding too if content is shared consistently in an authentic and appealing manner.

Strength of Ties

This study also investigated the effect of tie strength on viral spread of the video. Contrary to predictions, it was found that strong ties were more effective in viral spread of the video than weak ties. The strength of weak ties theory (Granovetter, 1973) provides an explanation of the process by which word-of-mouth communication operates. Granovetter (1973) claims that weak ties play a crucial role in clarifying and explaining the phenomenon of word-of-mouth in that they perform the important function of forming bridges between cliques allowing flow of information. Although studies (e.g. Granovetter, 1974; Liu & Duff, 1972) have supported the postulates of the theory for real word-of-mouth communication, electronic communication seems to be an exception. The findings from this study for strong and weak ties were in contrast to the claims of the theory. It can be concluded that weak ties are better disseminators of information only in the real world. In an electronic or online environment, strong ties perform better primarily due to credibility and trust issues playing in. Weak ties in an online environment come with security risks attached to them.

A possible explanation for the contrasting results is online fear and insecurity. The discrepancy between predictions and results could be due to the malicious effects of computer viruses. People fear the growing amount of crime and dangers involved in online activities. When it comes to receiving videos over the Internet either through e-mails or blogs or other online means, there is a high risk associated with the video being or carrying a virus that could damage the system.

Pool, as cited in Granovetter (1982), argues that whether one uses weak or strong ties for various purposes depends on the utility of the ties. The value to individuals of ties

with varying strengths also varies. A highly insecure individual is under strong pressure to become dependent upon one or more strong ties. Findings from Frenzen and Nakamoto's (1993) study have established a relationship between the hazardous nature of a message being diffused and strength of ties. The higher the hazard, the stronger is the tie that is fostered for diffusion. The technological danger in the context of viral videos could be an explanation for strong ties being activated more than weak ties for diffusion.

Also, the format of online mediums is such that some people find it advantageous to maintain strongly tied networks due to insecurity reasons. More recent crimes such as *phishing* are typically carried out through online activities like e-mail, instant messaging, or video sharing in an attempt to fraudulently acquire sensitive information. The fact that a variety of formats is available for online videos is exploited in cyber crime. Individuals participating in viewing and forwarding online videos are naturally wary about receiving such viruses on computers and are selective about the people they would want to associate with. People are increasingly becoming cautious when opening e-mails, attachments or videos; even from sources they trust. They are hesitant to open videos from unknown or less-known sources. There is also a resistance to engage in forwarding videos to less-known people for similar reasons. Also, the sender would be more likely to know that a given strong tie was interested in a video than a given weak tie.

Thus, an individual will be more likely to accept a video from or to pass along a video to a person she is familiar with and knows well for reasons of source credibility. It is likely that a strong tie may be perceived as a more credible source of information than a weak tie. The probability of opening a video when shared by an acquaintance or a weak tie reduces due to lack of required degree of trust. This pervasive use of strong ties by

online users could possibly be a response to technology threat and identity theft pressures. It can then be concluded that conditions online do not support the formation and maintenance of ties in a similar manner as offline.

Types of Ties

The findings on types of ties revealed that homophilous ties, both demographic and perceived, are more likely to contribute to viral spread of the video than heterophilous ties. Human communication works on the fundamental principle that exchange of ideas occur most frequently between individuals who are alike, or homophilous. However, homophily has served as a barrier to the process of diffusion (Rogers, 2003). The findings here were in contrast to previous research. Homophily increased the chances that a user would forward a video. It also increased the chances that a recipient would click on the video link and would view it. That is, referrals from sources who were close to the recipient in terms of age, sex, ethnicity, education, and occupation and who shared similar tastes and preferences were more likely to generate interest. The explanation for a finding opposite to what was expected again goes back to threat and insecurity on the Internet. It is less likely to receive a computer virus or be a victim of identity theft scams if the video is received from someone who is similar with respect to background and perception.

There are many implications of this finding for viral marketers. Like individuals are more likely to have similar product needs and wants. Once similarities in age, sex, education, and occupation are combined with similarities in behavior and values, there is greater likelihood in these individuals influencing one's interest in the product or service

being sold online. Once the video is opened to be viewed, similarities between the sender and the recipient become the most important drivers to trigger the recipient's interest (view and forward further). A crucial principle of viral marketing which follows from above discussion is that people link with others who are similar to themselves. However, this might result in the video being constrained to a group and eventually slow down its rate of spread. Companies should then make efforts to make the video reach separately in different clusters to avoid the message being trapped within one. Active motivation and practical support to transfer messages from one cluster to another is required.

Practical Implications

The results of this study help deepen our understanding of how the characteristics of audience, activities with video content, and relationships between individuals moderate the process of viral transmission. Knowing the audience is an important part of any marketing campaign, but with viral campaigns it is even more integral. In the light of these findings, it should not be surprising that those online marketers who have implemented viral campaigns have faced considerable challenges. It is crucial for marketers not only to consider a customer's intrinsic value but also her network value. Resources spent on a customer may be worthwhile if the combination of her interest in the product being advertised and her influence in the network is optimal. Further, a customer who looks valuable based on her own interests in the product may in fact not be worth marketing to if she is expected to have an overall negative effect on others in the market. For marketers interested in viral communication as a part of their strategy, ignoring the network value can result in incorrect marketing decisions, especially in a

market with strong network effects. Identifying such individuals within the target audience who have a high network value, however, is not an easy task. Research has documented some of the possible ways of identifying such highly connected individuals (Domingos & Richardson, 2001). Some of these include identifying opinion leaders, people who are very knowledgeable and credible about a product or idea, or even people who are communicative about a product or idea.

The results of the study revealed a favorable attitude toward online videos from young male adults. Nielsen Research studies show that audiences in this demographic group are the toughest to communicate to (Snierson & Wolk, 2003). The percentage of individuals within the age groups 18-30 tuning in to television has seen huge drops over the years. Viral advertising through online videos, then might be an effective way to reach these people. However, what needs to be kept in mind is the nature of the content. The content has to be in sync with the above demographic group who should perceive it to be important enough that they are compelled to stay tuned and pass it on.

Individuals in a network forward online videos to people they know and can identify which friends and family members would most appreciate and relate to the message. Close relationships in a network can be effective in capturing attention and creating awareness. The processes of viewing and forwarding videos investigated in this study can be associated with creating awareness about a particular product and/or message. Given the importance of strong ties and homophily to create awareness and trigger interest, it seems that networks of friends are more suited to the rapid and effective diffusion of online referrals. Attempts to initiate viral campaigns in the absence of close relationships among individuals in a network might fail.

In spite of employing the above strategies for a successful viral campaign, there are some problems that are likely to arise. One of the most important problems includes the inability to measure the effects of advertising. The benefit of a relatively inexpensive way to advertise by employing viral techniques may come at the expense of audience reach. Traditional advertising benefits from established tools such as Nielsen ratings that provide vital information to aid in strategic decisions. Viral advertising, being relatively new, brings with it the difficulty of measuring and evaluating the success of the campaign. As popularity of viral advertising increases, many companies have recognized the need for better measurement tools and are devising methods to measure their marketing efforts. For example, YouTube has introduced a free analytic tool, *Insight*, that enables tracking viewership statistics of the video.

Another big problem associated with viral advertising is the lack of control. Traditional methods of advertising have a better control over message content and dissemination. However, in viral communication, once the message is released there is no way for advertisers to know how it is being disseminated. There are chances that the message gets stuck within a wrong network and causes a negative impact to the product being advertised.

<center>Criticisms of Diffusion Theory</center>

Some aspects of the diffusion theory make its application difficult in the current context. First, the theory has a pro-innovation bias. Most diffusion research has been conducted to study adoptions of innovation that are inherently good and positive for the society. The act of adopting an innovation is considered positive and that of rejecting it is

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considered negative. This is then linked to individuals' levels of innovativeness. In this

research, innovation was considered to be a message transmitted through an online video.

Such an innovation cannot necessarily be defined as good or bad. These video pass

alongs are usually unsolicited, that is, they are sent to people who are not looking for

information. However, on reception, these people might find the video to be of relevance.

The act of viewing and forwarding a video (adoption in this case) hence cannot be linked

completely with an individual's innovative traits.

Also, most diffusion research on word-of-mouth communication has been

conducted in traditional contexts. Traditional word-of-mouth typically has been a face-to-

face communication where information is passed on by verbal means from one individual

to another. This usually entails a two-way interactive discussion. Viral videos, though are

similar to traditional word-of-mouth, are electronic by nature. Being Internet enabled

they have some distinct characteristics such as an open environment and a diverse and

multiple audience. This makes the process more complex and difficult to study.

Diffusion theory has been applied both at the micro and the macro levels of

analysis. At the micro level, the individual is usually the unit of analysis whereas at the

macro level, the unit of analysis is the population in its entirety. Micro-level diffusion

research primarily directs attention to individual differences and how these differences

play a role on adoption decisions. On the other hand, macro-level diffusion research

attempts to understand the diffusion process across populations such as firms,

organizations, countries and assumes a large degree of homogeneity in the members of

the population (Norton & Bass, 1987). The process of viral transmission of online videos

is a form of social networking where individuals exchange messages in the form of video

clips. Most of the individuals in this network are mere acquaintances of each other in an offline environment. However, the online nature of communication enables them to define themselves as part of a densely-knit cohesive group. This then blurs the line between micro and macro levels. Individuals might be heterogeneous with respect to each other, but analyzing them as part of a cohesive group assumes homogeneity. Thus, certain aspects of diffusion theory (e.g. innovation adoption consequences) that work well at a macro level due to homogeneity in the population do not seem to be applicable at the micro level in case of viral communication.

In a similar vein, the potential of weak and heterophilous ties in diffusion is observable at the macro level where information flows from one cohesive group to another. In case of viral transmission, the entire network is seen as one large cohesive group due to the characteristics of online social networking. Thus, some propositions that have been supported in offline contexts fail to replicate themselves in an online environment.

Limitations

The findings of this research are subject to several limitations. To start with, administering the survey online rather than offline resulted in a very low response rate. In spite of being offered extra credit for coursework, the responses did not come in at a rate they were expected to. Being online, the process of completion of data collection was more time consuming than a pencil-and-paper survey. The study focused on who-forwards-to-whom processes related to online videos in general. Although the impact of personal characteristics and relational properties would not be strikingly different, a

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distinction between videos formally used by marketers and those that have no promotional intention should have been made clear to the participants. There are several other psychographic factors such as attitudes toward electronic communication that affect online behavior which were not a part of the study. To be able to profile users, many more characteristics should have been studied. Factors such as individuals' opinion leadership traits and source expertise should have been included in the model. A substantial percentage of online video audience includes people who view videos online either after hearing it from friends, or after reading about it, or even after watching it on television. However, the study did not take into account this category. There was no specific measure of Internet usage for work and/or entertainment purposes.

Also, the items in the cosmopoliteness scale used for this study measured an international and global orientation. The scale should have been modified to measure the same concepts but in an online environment. Items such as interest in international web sites or that in web sites in a language other than English could have been used. Additionally, this being a college student sample, the demographic and personality variables were found to be highly correlated with cosmopoliteness. This could have been another reason for the absence of relationship between cosmopoliteness and viral transmission.

Another limitation of the study is the measurement of network-related constructs. The unit of analysis for these concepts in this study was individual level. However, network connectedness should ideally have been measured on a group/network level. It is important to note here that this measure of connectedness though operationalized based on its conceptual definition may not be the best way to collect data. Since the study used

an egocentric model, these items serve as a proxy for connectedness data. A data collection based on true network analysis would be the best way to measure connectedness in network. Similarly, strength of ties could have been measured taking into account factors such as amount of time known, emotional intensity, intimacy, and reciprocal services that characterize the tie (Granovetter, 1973). Also, other network measures such as *centrality* and *density* (see Monge, 1987) can be employed for future studies. Data on socio-psychographic characteristics and network properties should be collected at different levels of analysis and then integrated into one model.

Future Research

There are several suggestions for future research on online videos. First, a path analysis can be conducted to test the structural model concerning relationships among the antecedent variables eventually predicting likelihood of video forwarding. This will reveal if any of the antecedents have a mediated relationship through another variable with the video forwarding behavior. Socio-psychological characteristics such as opinion leadership and source expertise should be included. Usage of other new media applications such as text messaging, blogging, and instant messaging can also be a part of future studies. A combined theoretical model that includes both audience characteristics and activities with video content can be created and tested to see the effects on audience viewing and forwarding behavior.

Second, research should look into specific video content within the two genres of entertainment and information; for example political comedy versus situational comedy. Also, testing the above explanations for actual viral advertisements online is

recommended. The length of the video clip is another variable that can be investigated in future.

Third, an enhanced understanding of social desire and motivational processes in viewing online videos may be obtained by examining the patterns of how people watch videos. Also, an exploration of the dynamic interactions in online communication contexts should contribute to the understanding of viral spread of video. For example, factors such as computer mediated verbal and non-verbal cues, perceived reciprocity and perceived trustworthiness can be investigated. Research also needs to look more closely at how electronic word-of-mouth differs from traditional word-of-mouth in terms of metaphors used and norms observed. More research is needed to explore how these two modalities complement and reinforce each other.

Fourth, since network connectedness emerged to be the most important of all factors that were investigated, research could refine and include more items resulting in a better and a more precise measure. The measure could be consisting of a scale of items which eventually would tell us the predictors of network connectedness.

Finally, viral advertising is a new phenomenon that keeps evolving in a dynamic marketplace, and to which both firms and consumers are still adapting. Its long-term impact is still unclear in that there are questions about the effectiveness over time of the dissemination of a marketing message through an online video. In other words, the same study conducted a few years later in more mature market and with more accustomed users, might report different results. How consumers adapt their behavior to marketers' attempts in order to leverage their personal networks of acquaintances warrants further

research.

Conclusion

This study is one of the first investigations into viral videos from a social science perspective. In summary, this research studied online video audience looking into aspects of audience characteristics and online behavior that have never been examined. Although there are several variables that still need to be studied to understand the process in its entirety, the initial findings look promising. Findings of this study provide managerial implications to advertisers experimenting with an idea of viral advertising The characteristics of online video audience and their relationships with others help advertisers determine whom to target, how to effectively use, and when to use online videos as their promotional tools. A profile of online video audience would help marketers identify and reach the right target audience. Such knowledge can be a big asset in increasing the likelihood that online video audience can be exposed to the product or promotional messages embedded in the videos, thus heightening brand or message awareness.

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APPENDIX

APPENDIX A: SURVEY INSTRUMENT

Thanks for agreeing to complete the questionnaire.
There aren't any right or wrong answers. Please answer as honestly and as accurately as possible. All your responses will be kept strictly confidential.

1. Which of the following statements best describes you?
   a. I actively seek out for videos on web sites and then share them with my friends and acquaintances.
   b. I usually watch videos my friends and acquaintances share with me and forward them on.
   c. I usually watch videos my friends and acquaintances share with me but rarely forward them on.
   d. I rarely watch videos my friends and acquaintances share with me.

2. How do your friends and acquaintances usually share videos with you? (e.g. e-mails, instant messaging, text messaging, social networking web sites, blogs)

_____

_____

Questions 3 through 12 ask you about your preferences for types of video content viewed and forwarded online. Each type of video content is followed by a set of questions. Please follow the appropriate instructions provided with each set of questions.

Think about videos that are meant for fun, pleasure or relaxation. They could be funny videos, clips from TV shows or movies, or videos about political humor. These videos are NOT the ones that you think are intended for you to learn something. They are something you would watch only for entertainment.

3. Keeping such entertainment videos in mind please answer the questions below. Use a scale of 1-5 where 1 means "never" and 5 means "almost always".

   a. How frequently would you actively look out for an entertainment video on online video web sites?

1	2	3	4	5
Never				Almost always

   b. How frequently would you view an entertainment video when your friends and acquaintances share it with you?

1	2	3	4	5
Never				Almost always

   c. How frequently would you share an entertainment video with others?

1	2	3	4	5
Never				Almost always

4. Think of the people who would usually share entertainment videos with you online.

    a. On an average, how many other people are likely to share an entertainment video with you? ____

    b. How many of the people the entertainment video has been shared with are likely to know each other?__

    (Please answer zero, if nobody knows each other)

5. If you happen to pass on the entertainment video that you saw online or that your friends and acquaintances shared with you,

    a. On an average, how many other people are you likely to forward it to? ____

    b. How many of the people you forward it to are likely to know each other?__

    (Please answer zero, if you do not pass it on)

6. Using a scale of 1-5 where I means "not at all" and 5 means "a lot", how likely are you to open an entertainment video if it were from

    a. A close friend

        1   2   3   4   5

      Not at all   A lot

    b. An acquaintance

        1   2   3   4   5

    Not at all   A lot

7. Again using a scale of 1-5 where I means "not at all" and 5 means "a lot", how likely are you to forward an entertainment video to

    a. A close friend

        1   2   3   4   5

      Not at all   A lot

    b. An acquaintance

        1   2   3   4   5

    Not at all   A lot

Now, think about videos that are meant for learning. These videos are the ones that pass on knowledge about an issue that you think is useful and/or important. They could be news video clips, education videos or science/technology videos. They are NOT the ones that you watch just for fun and pleasure. They are something you would watch to gain information.

8. Keeping such informational videos in mind please answer the questions below. Use a scale of 1-5 where 1 means "never" and 5 means "almost always".

    a. How frequently would you actively look out for an informational video on online video web sites?

1	2	3	4	5
Never				Almost always

    b. How frequently would you view an informational video when your friends and acquaintances share it with you?

1	2	3	4	5
Never				Almost always

    c. How frequently would you share an informational video with others?

1	2	3	4	5
Never				Almost always

9. Think of the people who would usually share informational videos with you online.

    a. On an average, how many other people are likely to share an entertainment video with you? ____

    b. How many of the people the entertainment video has been shared with are likely to know each other?__

(Please answer zero, if nobody knows each other)

10. If you happen to pass on the informational video that you saw online or that your friends and acquaintances shared with you,

    a. On an average, how many other people are you likely to forward it to? ____

    b. How many of the people you forward it to are likely to know each other?__

(Please answer zero, if you do not pass it on)

11. Using a scale of 1-5 where I means "not at all" and 5 means "a lot", how likely are you to open an informational video if it were from

    a. A close friend

1	2	3	4	5
Not at all				A lot

    b. An acquaintance

1	2	3	4	5
Not at all				A lot

12. Again using a scale of 1-5 where I means "not at all" and 5 means "a lot", how likely are you to forward an informational video to

    a. A close friend

1	2	3	4	5
Not at all				A lot

    b. An acquaintance

1	2	3	4	5
Not at all				A lot

13. For the following set of questions, please use a scale of 1-3 where 1 means "yes", 2 means "no" and 3 means "don't know". Think of the person who shares videos with you the most. If there are many people, pick one. Comparing yourself to this person, how similar would you say he/she is to you in terms of

a. Age

1	2	3
Yes	No	Don't Know

b. Ethnic Background

1	2	3
Yes	No	Don't Know

c. Education Level

1	2	3
Yes	No	Don't Know

d. Occupation

1	2	3
Yes	No	Don't Know

e. Hobbies

1	2	3
Yes	No	Don't Know

f. Sex

1	2	3
Yes	No	Don't Know

14. Again, think of the person who shares videos with you the most. If there are many people, pick one. Using a scale of 1-5, where 1 means "Strongly disagree" and 5 means "Strongly agree", how would you rate the following statements?

    a. This person is very similar to me.

1	2	3	4	5

Strongly Disagree   Strongly Agree

b. This person thinks like me.
            1   2   3   4   5
         Strongly Disagree   Strongly Agree

c. This person behaves like me.
            1   2   3   4   5
         Strongly Disagree   Strongly Agree

d. This person sees the world the same way as I do.
            1   2   3   4   5
         Strongly Disagree   Strongly Agree

15. For the following statements, please use a scale of 1-5 where 1 means "Strongly disagree" and 5 means "Strongly agree".

a. I like to experiment.
            1   2   3   4   5
         Strongly Disagree   Strongly Agree

b. I don't like to take chances if I don't have to.
            1   2   3   4   5
         Strongly Disagree   Strongly Agree

c. I feel that the tried and true ways of doing things are the best at work and in my life.
            1   2   3   4   5
         Strongly Disagree   Strongly Agree

d. I take chances more than others do.
            1   2   3   4   5
         Strongly Disagree   Strongly Agree

e. I would not risk my position at work by putting into effect some new idea that might not work.
            1   2   3   4   5
         Strongly Disagree   Strongly Agree

f. I like to explore new technologies to see what they are like.
            1   2   3   4   5
         Strongly Disagree   Strongly Agree

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g. I like a great deal of variety.

1	2	3	4	5
Strongly Disagree				Strongly Agree

h. Unless there is a good reason for changing, I think we should continue doing things the way they are being done now.

1	2	3	4	5
Strongly Disagree				Strongly Agree

i. I like to try new ideas at work and in my life.

1	2	3	4	5
Strongly Disagree				Strongly Agree

j. I like new styles and things that are different.

1	2	3	4	5
Strongly Disagree				Strongly Agree

k. In hunting for the best way of doing something, it is usually a good idea to look at the situation from a completely different angle – one that wouldn't occur to someone.

1	2	3	4	5
Strongly Disagree				Strongly Agree

l. I'm the kind of person who is always looking for an exciting, stimulating and active life.

1	2	3	4	5
Strongly Disagree				Strongly Agree

m. I am confident in my abilities to research before making important decisions.

1	2	3	4	5
Strongly Disagree				Strongly Agree

n. I know the right questions to ask before making decisions.

1	2	3	4	5
Strongly Disagree				Strongly Agree

o. I trust my own judgment.

1	2	3	4	5
Strongly Disagree				Strongly Agree

p. Too often the decisions I make are not satisfying.

1	2	3	4	5
Strongly Disagree				Strongly Agree

q. I get compliments from others on my decisions.

1	2	3	4	5

Strongly Disagree   Strongly Agree

r. I am hesitant to complain when a problem arises.
        1   2   3   4   5
    Strongly Disagree   Strongly Agree

16. Again, for the following statements, please use a scale of 1-5 where 1 means "strongly disagree" and 5 means "strongly agree".

a. In any given month I communicate with people from a wide variety of backgrounds and cultures.
        1   2   3   4   5
    Strongly Disagree   Strongly Agree

b. I think of myself as a citizen of the world.
        1   2   3   4   5
    Strongly Disagree   Strongly Agree

c. I'm more aware of what is going on around the world than most of my friends.
        1   2   3   4   5
    Strongly Disagree   Strongly Agree

d. I enjoy traveling to different countries.
        1   2   3   4   5
    Strongly Disagree   Strongly Agree

e. I am interested in current events in other countries around the world.
        1   2   3   4   5
    Strongly Disagree   Strongly Agree

f. I enjoy learning about different cultures.
        1   2   3   4   5
    Strongly Disagree   Strongly Agree

17. On an average, how many hours per week do you use the Internet?
    a. 0
    b. 1-5
    c. 6-10
    d. 11-15
    e. 16-20
    f. 21 or more

Just a few more questions about yourself.

18. Are you
       a. Male OR
       b. Female

19. What is your age (in years)?_____

20. What is your marital status?
       a. Single (Never been married)
       b. Married
       c. Separated/Divorced
       d. Widowed

21. What is the highest level of education you have completed?
a. Some high school
b. High school graduate
c. Technical school/Training
d. Some college/University
e. College/University graduate
f. Masters-level graduate
g. Doctoral-level graduate

22. What is your current employment status?
a. Employed-Full time
b. Employed-Part time
c. Temporarily Unemployed
d. Self employed
e. Student
f. Retired
g. Other

23. What is your racial/ethnic background?
a. White/Caucasian
b. Black/African American
c. Asian/Asian American
d. Hispanic
e. American Indian/Native American
f. Mixed
g. Other

24. Please enter your name, the course number and the name of the instructor in the space provided below.

    a. Name_____

    b. Course Number_____

    c. Name of the Instructor_____

Thank you very much for your participation.

APPENDIX B: IRB APPROVAL

Cleveland State University

College of Graduate Studies and Research
Office of Sponsored Programs and Research
Institutional Review Board (IRB)

Memorandum

To: Gary Pettey
Communication
MU 217

From: Daniel P. O'Donnell
Consultant for Compliance,
Institutional Review Board
Office of Sponsored Programs & Research

Date: 11 October 2007
Re: Results of IRB Review of your project number: 28049-PET-HS
Co-Investigator: Trupti Guha
Entitled: Catching the video virus: Understanding individuals involved in diffusion of online video through networks

The IRB has reviewed and approved your application for the above named project, under the category noted below. Approval for use of human subjects in this research is for one year from the approval date listed below. If your study extends beyond this approval period, please contact this office to initiate an annual review of the project. *This approval expires at 11:59 pm on 10/8/2008.*

By accepting this decision, you agree to notify the IRB of: (1) any additions to or changes in procedures for your study that modify the subjects' risk in any way; and (2) any events that affect that safety or well-being of subjects.

Thank you for your efforts to maintain compliance with the federal regulations for the protection of human subjects.

Approval Category: **Date: 10/9/2007**

☒   Exempt Status: Project is exempt from further review under 45 CFR 46.101 (b) (2)

☐   Expedited Review: Project approved, Expedited Category

☐   Regular IRB Approval

cc: Project file

APPENDIX C: TABLES

Table C1

Online video audience categories

	Frequency	%	Valid %	Cumulative %
Actively seek out for videos and share	26	9.7	9.7	9.7
Watch videos shared and forward them on	63	23.5	23.5	33.2
Watch videos shared but rarely forward them on	104	38.8	38.8	72.0
Rarely watch videos shared	75	28.0	28.0	100.0
Total	268	100.0	100.0	

Table C2

Frequency of actively seeking entertainment videos

		Frequency	%	Valid %	Cumulative %
Mean = 2.64	1=Never	52	19.4	19.4	19.4
SD = 1.20	2	79	29.5	29.5	48.9
	3	75	28.0	28.0	76.9
	4	38	14.2	14.2	91.0
	5=Almost Always	24	9.0	9.0	100.0
	Total	268	100.0	100.0	

Table C3

Frequency of viewing entertainment videos when shared

		Frequency	%	Valid %	Cumulative %
Mean = 3.64	1=Never	16	6.0	6.0	6.0
SD = 1.24	2	39	14.6	14.6	20.5
	3	58	21.6	21.6	42.2
	4	68	25.4	25.4	67.5
	5=Almost Always	87	32.5	32.5	100.0
	Total	268	100.0	100.0	

Table C4

Frequency of sharing entertainment videos

		Frequency	%	Valid %	Cumulative %
Mean = 2.51	1=Never	55	20.5	20.5	20.5
SD = 1.16	2	93	34.7	34.7	55.2
	3	65	24.3	24.3	79.5
	4	37	13.8	13.8	93.3
	5=Almost Always	18	6.7	6.7	100.0
	Total	268	100.0	100.0	

Table C5

Number of people likely to share entertainment video

	Frequency	%	Valid %	Cumulative %
0	21	7.8	7.8	7.8
1	15	5.6	5.6	13.4
2	45	16.8	16.8	30.2
3	56	20.9	20.9	51.1
4	28	10.4	10.4	61.6
5	56	20.9	20.9	82.5
6	2	.7	.7	83.2
7	5	1.9	1.9	85.1
8	6	2.2	2.2	87.3
9	1	.4	.4	87.7
10	19	7.1	7.1	94.8
12	2	.7	.7	95.5
15	5	1.9	1.9	97.4
20	4	1.5	1.5	98.9
25	1	.4	.4	99.3
100	1	.4	.4	99.6
500	1	.4	.4	100.0
Total	268	100.0	100.0	

Table C6

Number of people entertainment video has been shared with likely to know each other

	Frequency	%	Valid %	Cumulative %
0	56	20.9	20.9	20.9
1	17	6.3	6.3	27.2
2	48	17.9	17.9	45.1
3	53	19.8	19.8	64.9
4	24	9.0	9.0	73.9
5	36	13.4	13.4	87.3
6	3	1.1	1.1	88.4
7	3	1.1	1.1	89.6
8	5	1.9	1.9	91.4
9	2	.7	.7	92.2
10	15	5.6	5.6	97.8
12	1	.4	.4	98.1
15	1	.4	.4	98.5
20	1	.4	.4	98.9
25	1	.4	.4	99.3
30	1	.4	.4	99.6
500	1	.4	.4	100.0
Total	268	100.0	100.0	

Table C7

Number of people likely to forward entertainment video to

	Frequency	%	Valid %	Cumulative %
0	80	29.9	29.9	29.9
1	26	9.7	9.7	39.6
2	49	18.3	18.3	57.8
3	33	12.3	12.3	70.1
4	10	3.7	3.7	73.9
5	33	12.3	12.3	86.2
6	1	.4	.4	86.6
7	3	1.1	1.1	87.7
8	5	1.9	1.9	89.6
10	16	6.0	6.0	95.5
12	2	.7	.7	96.3
15	6	2.2	2.2	98.5
20	2	.7	.7	99.3
100	1	.4	.4	99.6
500	1	.4	.4	100.0
Total	268	100.0	100.0	

Table C8

Number of people entertainment video forwarded to likely to know each other

	Frequency	%	Valid %	Cumulative %
0	103	38.4	38.4	38.4
1	14	5.2	5.2	43.7
2	53	19.8	19.8	63.4
3	32	11.9	11.9	75.4
4	11	4.1	4.1	79.5
5	25	9.3	9.3	88.8
7	6	2.2	2.2	91.0
8	6	2.2	2.2	93.3
9	2	.7	.7	94.0
10	12	4.5	4.5	98.5
15	1	.4	.4	98.9
20	2	.7	.7	99.6
500	1	.4	.4	100.0
Total	268	100.0	100.0	

Table C9

Likelihood of opening entertainment video from close friend

		Frequency	%	Valid %	Cumulative %
Mean = 4.22	1=Not at all	16	6.0	6.0	6.0
SD = 1.16	2	9	3.4	3.4	9.4
	3	32	11.9	12.0	21.4
	4	53	19.8	19.9	41.4
	5=A lot	156	58.2	58.6	100.0
	Total	266	99.3	100.0	
Missing	99	2	.7		
Total		268	100.0		

Table C10

Likelihood of opening entertainment video from acquaintance

		Frequency	%	Valid %	Cumulative %
Mean = 2.75	1=Not at all	47	17.5	17.6	17.6
SD = 1.18	2	61	22.8	22.8	40.4
	3	97	36.2	36.3	76.8
	4	37	13.8	13.9	90.6
	5=A lot	25	9.3	9.4	100.0
	Total	267	99.6	100.0	
Missing	99	1	.4		
Total		268	100.0		

Table C11

Likelihood of forwarding entertainment video to close friend

		Frequency	%	Valid %	Cumulative %
Mean = 3.29	1=Not at all	43	16.0	16.5	16.5
SD = 1.47	2	43	16.0	16.5	33.0
	3	51	19.0	19.5	52.5
	4	44	16.4	16.9	69.3
	5=A lot	80	29.9	30.7	100.0
	Total	261	97.4	100.0	
Missing	99	7	2.6		
Total		268	100.0		

Table C12

Likelihood of forwarding entertainment video to acquaintance

		Frequency	%	Valid %	Cumulative %
Mean = 2.02	1=Not at all	112	41.8	42.9	42.9
SD = 1.13	2	70	26.1	26.8	69.7
	3	51	19.0	19.5	89.3
	4	17	6.3	6.5	95.8
	5=A lot	11	4.1	4.2	100.0
	Total	261	97.4	100.0	
Missing	99	7	2.6		
Total		268	100.0		

Table C13

Frequency of actively seeking informational videos

		Frequency	%	Valid %	Cumulative %
Mean = 2.38	1=Never	71	26.5	26.5	26.5
SD = 1.10	2	74	27.6	27.6	54.1
	3	80	29.9	29.9	84.0
	4	35	13.1	13.1	97.0
	5=Almost Always	8	3.0	3.0	100.0
	Total	268	100.0	100.0	

Table C14

Frequency of actively viewing informational videos when shared

		Frequency	%	Valid %	Cumulative %
Mean = 2.91	1=Never	45	16.8	16.9	16.9
SD = 1.30	2	63	23.5	23.6	40.4
	3	68	25.4	25.5	65.9
	4	53	19.8	19.9	85.8
	5=Almost Always	38	14.2	14.2	100.0
	Total	267	99.6	100.0	
Missing	99	1	.4		
Total		268	100.0		

Table C15

Frequency of sharing informational videos

		Frequency	%	Valid %	Cumulative %
Mean = 2.23	1=Never	75	28.0	28.0	28.0
SD = 1.04	2	95	35.4	35.4	63.4
	3	66	24.6	24.6	88.1
	4	25	9.3	9.3	97.4
	5=Almost Always	7	2.6	2.6	100.0
	Total	268	100.0	100.0	

Table C16

Number of people likely to share informational video

	Frequency	%	Valid %	Cumulative %
0	73	27.2	27.2	27.2
1	54	20.1	20.1	47.4
2	48	17.9	17.9	65.3
3	33	12.3	12.3	77.6
4	16	6.0	6.0	83.6
5	30	11.2	11.2	94.8
6	1	.4	.4	95.1
7	1	.4	.4	95.5
8	2	.7	.7	96.3
10	4	1.5	1.5	97.8
12	1	.4	.4	98.1
15	3	1.1	1.1	99.3
20	1	.4	.4	99.6
100	1	.4	.4	100.0
Total	268	100.0	100.0	

Table C17

Number of people informational video has been shared with likely to know each other

	Frequency	%	Valid %	Cumulative %
0	111	41.4	41.4	41.4
1	37	13.8	13.8	55.2
2	46	17.2	17.2	72.4
3	31	11.6	11.6	84.0
4	16	6.0	6.0	89.9
5	16	6.0	6.0	95.9
6	2	.7	.7	96.6
7	1	.4	.4	97.0
8	3	1.1	1.1	98.1
9	2	.7	.7	98.9
10	1	.4	.4	99.3
12	1	.4	.4	99.6
30	1	.4	.4	100.0
Total	268	100.0	100.0	

Table C18

Number of people likely to forward informational video to

	Frequency	%	Valid %	Cumulative %
0	113	42.2	42.2	42.2
1	34	12.7	12.7	54.9
2	44	16.4	16.4	71.3
3	34	12.7	12.7	84.0
4	8	3.0	3.0	86.9
5	22	8.2	8.2	95.1
7	3	1.1	1.1	96.3
8	1	.4	.4	96.6
10	4	1.5	1.5	98.1
11	1	.4	.4	98.5
12	1	.4	.4	98.9
15	3	1.1	1.1	100.0
Total	268	100.0	100.0	

Table C19

Number of people informational video forwarded to likely to know each other

	Frequency	%	Valid %	Cumulative %
0	136	50.7	50.7	50.7
1	27	10.1	10.1	60.8
2	47	17.5	17.5	78.4
3	27	10.1	10.1	88.4
4	10	3.7	3.7	92.2
5	11	4.1	4.1	96.3
7	1	.4	.4	96.6
8	3	1.1	1.1	97.8
9	1	.4	.4	98.1
10	4	1.5	1.5	99.6
12	1	.4	.4	100.0
Total	268	100.0	100.0	

Table C20

Likelihood of opening informational video from close friend

		Frequency	%	Valid %	Cumulative %
Mean = 3.77	1=Not at all	23	8.6	8.6	8.6
SD = 1.32	2	27	10.1	10.1	18.7
	3	50	18.7	18.7	37.5
	4	55	20.5	20.6	58.1
	5=A lot	112	41.8	41.9	100.0
	Total	267	99.6	100.0	
Missing	99	1	.4		
Total		268	100.0		

Table C21

Likelihood of opening informational video from acquaintance

		Frequency	%	Valid %	Cumulative %
Mean = 2.40	1=Not at all	79	29.5	29.6	29.6
SD = 1.21	2	67	25.0	25.1	54.7
	3	74	27.6	27.7	82.4
	4	29	10.8	10.9	93.3
	5=A lot	18	6.7	6.7	100.0
	Total	267	99.6	100.0	
Missing	99	1	.4		
Total		268	100.0		

Table C22

Likelihood of forwarding informational video to close friend

		Frequency	%	Valid %	Cumulative %
Mean = 2.96	1=Not at all	53	19.8	20.1	20.1
SD = 1.41	2	51	19.0	19.3	39.4
	3	71	26.5	26.9	66.3
	4	32	11.9	12.1	78.4
	5=A lot	57	21.3	21.6	100.0
	Total	264	98.5	100.0	
Missing	99	4	1.5		
Total		268	100.0		

Table C23

Likelihood of forwarding informational video to acquaintance

		Frequency	%	Valid %	Cumulative %
Mean = 1.93	1=Not at all	129	48.1	49.0	49.0
SD = 1.13	2	60	22.4	22.8	71.9
	3	48	17.9	18.3	90.1
	4	15	5.6	5.7	95.8
	5=A lot	11	4.1	4.2	100.0
	Total	263	98.1	100.0	
Missing	99	5	1.9		
Total		268	100.0		

Table C24

Similarity with person who shares videos most - Age

		Frequency	%	Valid %	Cumulative %
Mean = 1.27	1=Yes	214	79.9	80.1	80.1
SD = 0.58	2=No	34	12.7	12.7	92.9
	3=Don't Know	19	7.1	7.1	100.0
	Total	267	99.6	100.0	
Missing	99	1	.4		
Total		268	100.0		

Table C25

Similarity with person who shares videos most - Ethnic background

		Frequency	%	Valid %	Cumulative %
Mean = 1.37	1=Yes	199	74.3	74.5	74.5
SD = 0.68	2=No	38	14.2	14.2	88.8
	3=Don't Know	30	11.2	11.2	100.0
	Total	267	99.6	100.0	
Missing	99	1	.4		
Total		268	100.0		

Table C26

Similarity with person who shares videos most - Education level

		Frequency	%	Valid %	Cumulative %
Mean = 1.44	1=Yes	174	64.9	65.4	65.4
SD = 0.65	2=No	68	25.4	25.6	91.0
	3=Don't Know	24	9.0	9.0	100.0
	Total	266	99.3	100.0	
Missing	99	2	.7		
Total		268	100.0		

Table C27

Similarity with person who shares videos most - Occupation

		Frequency	%	Valid %	Cumulative %
Mean = 1.85	1=Yes	74	27.6	27.7	27.7
SD = 0.62	2=No	159	59.3	59.6	87.3
	3=Don't Know	34	12.7	12.7	100.0
	Total	267	99.6	100.0	
Missing	99	1	.4		
Total		268	100.0		

Table C28

Similarity with person who shares videos most - Sex

		Frequency	%	Valid %	Cumulative %
Mean = 1.61	1=Yes	140	52.2	52.4	52.4
SD = 0.71	2=No	92	34.3	34.5	86.9
	3=Don't Know	35	13.1	13.1	100.0
	Total	267	99.6	100.0	
Missing	99	1	.4		
Total		268	100.0		

Table C29

This person is very similar to me

		Frequency	%	Valid %	Cumulative %
Mean = 3.63	1=Strongly disagree	8	3.0	3.0	3.0
SD = 1.01	2	21	7.8	7.9	10.9
	3	94	35.1	35.2	46.1
	4	84	31.3	31.5	77.5
	5=Strongly agree	60	22.4	22.5	100.0
	Total	267	99.6	100.0	
Missing	99	1	.4		
Total		268	100.0		

Table C30

This person thinks like me

		Frequency	%	Valid %	Cumulative %
Mean = 3.50	1=Strongly disagree	9	3.4	3.4	3.4
SD = 1.03	2	33	12.3	12.4	15.7
	3	88	32.8	33.0	48.7
	4	89	33.2	33.3	82.0
	5=Strongly agree	48	17.9	18.0	100.0
	Total	267	99.6	100.0	
Missing	99	1	.4		
Total		268	100.0		

Table C31

This person behaves like me

		Frequency	%	Valid %	Cumulative %
Mean = 3.13	1=Strongly disagree	17	6.3	6.4	6.4
SD = 1.03	2	49	18.3	18.4	24.7
	3	109	40.7	40.8	65.5
	4	66	24.6	24.7	90.3
	Strongly agree	26	9.7	9.7	100.0
	Total	267	99.6	100.0	
Missing	99	1	.4		
Total		268	100.0		

Table C32

This person sees the world the same way as I do

		Frequency	%	Valid %	Cumulative %
Mean = 3.18	1=Strongly disagree	15	5.6	5.6	5.6
SD = 0.99	2	46	17.2	17.2	22.8
	3	103	38.4	38.6	61.4
	4	82	30.6	30.7	92.1
	5=Strongly agree	21	7.8	7.9	100.0
	Total	267	99.6	100.0	
Missing	99	1	.4		
Total		268	100.0		

Table C33

I like to experiment

		Frequency	%	Valid %	Cumulative %
Mean = 3.46	1=Strongly disagree	15	5.6	5.6	5.6
SD = 1.07	2	27	10.1	10.1	15.7
	3	94	35.1	35.2	50.9
	4	83	31.0	31.1	82.0
	5=Strongly agree	48	17.9	18.0	100.0
	Total	267	99.6	100.0	
Missing	99	1	.4		
Total		268	100.0		

Table C34

I don't like to take chances if I don't have to

		Frequency	%	Valid %	Cumulative %
Mean = 2.73	1=Strongly disagree	41	15.3	15.4	15.4
SD = 1.14	2	76	28.4	28.5	43.8
	3	84	31.3	31.5	75.3
	4	46	17.2	17.2	92.5
	5=Strongly agree	20	7.5	7.5	100.0
	Total	267	99.6	100.0	
Missing	99	1	.4		
Total		268	100.0		

Table C35

I feel that the tried and true ways of doing things are the best at work and in my life

		Frequency	%	Valid %	Cumulative %
Mean = 2.99	1=Strongly disagree	18	6.7	6.7	6.7
SD = 0.97	2	58	21.6	21.7	28.5
	3	114	42.5	42.7	71.2
	4	63	23.5	23.6	94.8
	5=Strongly agree	14	5.2	5.2	100.0
	Total	267	99.6	100.0	
Missing	99	1	.4		
Total		268	100.0		

Table C36

I take chances more than others do

		Frequency	%	Valid %	Cumulative %
Mean = 2.99	1=Strongly disagree	23	8.6	8.7	8.7
SD = 1.06	2	63	23.5	23.8	32.5
	3	90	33.6	34.0	66.4
	4	72	26.9	27.2	93.6
	5=Strongly agree	17	6.3	6.4	100.0
	Total	265	98.9	100.0	
Missing	99	3	1.1		
Total		268	100.0		

Table C37

I would not risk my position at work by putting into effect some new idea that might not work

		Frequency	%	Valid %	Cumulative %
Mean = 2.72	1=Strongly disagree	38	14.2	14.2	14.2
SD = 1.14	2	85	31.7	31.8	46.1
	3	80	29.9	30.0	76.0
	4	43	16.0	16.1	92.1
	5=Strongly agree	21	7.8	7.9	100.0
	Total	267	99.6	100.0	
Missing	99	1	.4		
Total		268	100.0		

Table C38

I like to explore new technologies to see what they are like

		Frequency	%	Valid %	Cumulative %
Mean = 3.41	1=Strongly disagree	15	5.6	5.6	5.6
SD = 1.18	2	49	18.3	18.4	24.0
	3	73	27.2	27.3	51.3
	4	71	26.5	26.6	77.9
	5=Strongly agree	59	22.0	22.1	100.0
	Total	267	99.6	100.0	
Missing	99	1	.4		
Total		268	100.0		

Table C39

I like a great deal of variety

		Frequency	%	Valid %	Cumulative %
Mean = 3.81	1=Strongly disagree	6	2.2	2.2	2.2
SD = 1.03	2	23	8.6	8.6	10.9
	3	67	25.0	25.1	36.0
	4	91	34.0	34.1	70.0
	5=Strongly agree	80	29.9	30.0	100.0
	Total	267	99.6	100.0	
Missing	99	1	.4		
Total		268	100.0		

Table C40
Unless there is a good reason for changing, I think we should continue doing things the way they are being done now

		Frequency	%	Valid %	Cumulative %
Mean = 2.82	1=Strongly disagree	29	10.8	10.9	10.9
SD = 1.08	2	76	28.4	28.5	39.3
	3	96	35.8	36.0	75.3
	4	46	17.2	17.2	92.5
	5=Strongly agree	20	7.5	7.5	100.0
	Total	267	99.6	100.0	
Missing	99	1	.4		
Total		268	100.0		

Table C41

I like to try new ideas at work and in my life

		Frequency	%	Valid %	Cumulative %
Mean = 3.55	1=Strongly disagree	9	3.4	3.4	3.4
SD = 0.94	2	16	6.0	6.0	9.4
	3	100	37.3	37.6	47.0
	4	101	37.7	38.0	85.0
	5=Strongly agree	40	14.9	15.0	100.0
	Total	266	99.3	100.0	
Missing	99	2	.7		
Total		268	100.0		

Table C42

I like new styles and things that are different

		Frequency	%	Valid %	Cumulative %
Mean = 3.66	1=Strongly disagree	6	2.2	2.2	2.2
SD = 1.02	2	29	10.8	10.9	13.1
	3	76	28.4	28.5	41.6
	4	95	35.4	35.6	77.2
	5=Strongly agree	61	22.8	22.8	100.0
	Total	267	99.6	100.0	
Missing	99	1	.4		
Total		268	100.0		

Table C43
In hunting for the best way of doing something, it is usually a good idea to look at the situation from a different angle

		Frequency	%	Valid %	Cumulative %
Mean = 3.65	1=Strongly disagree	5	1.9	1.9	1.9
SD = 0.99	2	26	9.7	9.8	11.7
	3	83	31.0	31.2	42.9
	4	94	35.1	35.3	78.2
	5=Strongly agree	58	21.6	21.8	100.0
	Total	266	99.3	100.0	
Missing	99	2	.7		
Total		268	100.0		

Table C44

I'm the kind of person who is always looking for an exciting, stimulating and active life

		Frequency	%	Valid %	Cumulative %
Mean = 3.74	1=Strongly disagree	4	1.5	1.5	1.5
SD = 0.94	2	15	5.6	5.6	7.1
	3	93	34.7	34.8	41.9
	4	89	33.2	33.3	75.3
	5=Strongly agree	66	24.6	24.7	100.0
	Total	267	99.6	100.0	
Missing	99	1	.4		
Total		268	100.0		

Table C45

I am confident in my abilities to research before making important decisions

		Frequency	%	Valid %	Cumulative %
Mean 3.78	1=Strongly disagree	4	1.5	1.5	1.5
SD = 0.95	2	18	6.7	6.7	8.2
	3	79	29.5	29.6	37.8
	4	99	36.9	37.1	74.9
	5=Strongly agree	67	25.0	25.1	100.0
	Total	267	99.6	100.0	
Missing	99	1	.4		
Total		268	100.0		

Table C46

I know the right questions to ask before making decisions

		Frequency	%	Valid %	Cumulative %
Mean = 3.56	1=Strongly disagree	3	1.1	1.1	1.1
SD = 0.90	2	23	8.6	8.6	9.7
	3	105	39.2	39.3	49.1
	4	93	34.7	34.8	83.9
	5=Strongly agree	43	16.0	16.1	100.0
	Total	267	99.6	100.0	
Missing	99	1	.4		
Total		268	100.0		

Table C47

I trust my own judgment

		Frequency	%	Valid %	Cumulative %
Mean = 3.92	1=Strongly disagree	6	2.2	2.2	2.2
SD = 0.95	2	14	5.2	5.2	7.5
	3	54	20.1	20.2	27.7
	4	114	42.5	42.7	70.4
	5=Strongly agree	79	29.5	29.6	100.0
	Total	267	99.6	100.0	
Missing	99	1	.4		
Total		268	100.0		

Table C48

Too often the decisions I make are not satisfying

		Frequency	%	Valid %	Cumulative %
Mean = 2.30	1=Strongly disagree	45	16.8	17.0	17.0
SD = 0.88	2	122	45.5	46.0	63.0
	3	76	28.4	28.7	91.7
	4	18	6.7	6.8	98.5
	5=Strongly agree	4	1.5	1.5	100.0
	Total	265	98.9	100.0	
Missing	99	3	1.1		
Total		268	100.0		

Table C49

I get compliments from others on my decisions

		Frequency	%	Valid %	Cumulative %
Mean = 3.56	1=Strongly disagree	7	2.6	2.6	2.6
SD = 0.99	2	27	10.1	10.2	12.8
	3	89	33.2	33.5	46.2
	4	95	35.4	35.7	82.0
	5=Strongly agree	48	17.9	18.0	100.0
	Total	266	99.3	100.0	
Missing	99	2	.7		
Total		268	100.0		

Table C50

I am hesitant to complain when a problem arises

		Frequency	%	Valid %	Cumulative %
Mean = 2.74	1=Strongly disagree	47	17.5	17.6	17.6
SD = 1.20	2	69	25.7	25.8	43.4
	3	84	31.3	31.5	74.9
	4	41	15.3	15.4	90.3
	5=Strongly agree	26	9.7	9.7	100.0
	Total	267	99.6	100.0	
Missing	99	1	.4		
Total		268	100.0		

Table C51

In any given month I communicate with people from a wide variety of backgrounds and cultures

		Frequency	%	Valid %	Cumulative %
Mean = 3.76	1=Strongly disagree	12	4.5	4.5	4.5
SD = 1.17	2	26	9.7	9.8	14.3
	3	68	25.4	25.7	40.0
	4	66	24.6	24.9	64.9
	5=Strongly agree	93	34.7	35.1	100.0
	Total	265	98.9	100.0	
Missing	99	3	1.1		
Total		268	100.0		

Table C52

I think of myself as a citizen of the world

		Frequency	%	Valid %	Cumulative %
Mean = 3.62	1=Strongly disagree	13	4.9	4.9	4.9
SD = 1.15	2	28	10.4	10.5	15.4
	3	82	30.6	30.8	46.2
	4	66	24.6	24.8	71.1
	5=Strongly agree	77	28.7	28.9	100.0
	Total	266	99.3	100.0	
Missing	99	2	.7		
Total		268	100.0		

Table C53

I am more aware of what is going on around the world than most of my friends

		Frequency	%	Valid %	Cumulative %
Mean = 3.39	1=Strongly disagree	17	6.3	6.4	6.4
SD = 1.15	2	38	14.2	14.3	20.7
	3	89	33.2	33.5	54.1
	4	67	25.0	25.2	79.3
	5=Strongly agree	55	20.5	20.7	100.0
	Total	266	99.3	100.0	
Missing	99	2	.7		
Total		268	100.0		

Table C54

I enjoy traveling to different countries

		Frequency	%	Valid %	Cumulative %
Mean = 3.79	1=Strongly disagree	18	6.7	6.8	6.8
SD = 1.21	2	18	6.7	6.8	13.6
	3	65	24.3	24.5	38.1
	4	65	24.3	24.5	62.6
	5=Strongly agree	99	36.9	37.4	100.0
	Total	265	98.9	100.0	
Missing	99	3	1.1		
Total		268	100.0		

Table C55

I am interested in current events in other countries around the world

		Frequency	%	Valid %	Cumulative %
Mean = 3.52	1=Strongly disagree	15	5.6	5.6	5.6
SD = 1.20	2	41	15.3	15.4	21.1
	3	71	26.5	26.7	47.7
	4	68	25.4	25.6	73.3
	5=Strongly agree	71	26.5	26.7	100.0
	Total	266	99.3	100.0	
Missing	99	2	.7		
Total		268	100.0		

Table 56

I enjoy learning about different cultures

		Frequency	%	Valid %	Cumulative %
Mean = 3.94	1=Strongly disagree	9	3.4	3.4	3.4
SD = 1.14	2	25	9.3	9.4	12.8
	3	50	18.7	18.8	31.6
	4	70	26.1	26.3	57.9
	5=Strongly agree	112	41.8	42.1	100.0
	Total	266	99.3	100.0	
Missing	99	2	.7		
Total		268	100.0		

Table C57

How many hours per week do you use the Internet?

		Frequency	%	Valid %	Cumulative %
Mean = 3.88	1-5 hours	60	22.4	22.4	22.4
SD = 1.44	6-10 hours	65	24.3	24.3	46.6
	11-15 hours	41	15.3	15.3	61.9
	16-20 hours	51	19.0	19.0	81.0
	21 or more	51	19.0	19.0	100.0
	Total	268	100.0	100.0	

Table C58

Inter-correlations between Network Connectedness measures

Measure	1	2	3	4
Network Connectedness - Entertainment - Opening	-	0.39***	0.43***	0.39***
Network Connectedness - Entertainment - Forwarding		-	0.40***	0.55***
Network Connectedness - Information – Opening			-	0.56***
Network Connectedness - Information – Forwarding				-

Note. ***$p \leq .001$

Fig. D1

Scree Plot for Factor Analysis – Venturesomeness