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Communication and the Evolution of SNS: Cultural Convergence Perspective

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Recently, East Asians have become fascinated by social networking and have paid a great deal of attention to social networking websites such as Facebook, Cyworld and Twitter in East Asia. In the academic domain there have been a number of research projects focusing on how people use the social media to enhance social connections, their impact on political processes, how they can be used to obtain employment, enhance trust and market new products. From Korea to Singapore, SNS seem to be changing the fabric of Asian society for better or worse. Their impact seems to be ubiquitous.

However, media come and go. In the jargon of Communication Science, they are adopted and then disadopted. That is, their use is discontinued. The classic case is the decline or discontinuance in cinema attendance, listening to the radio, and the loss of readership of general-interest magazines in the United States in the 1950s that coincided with the adoption of television.

Within the area of communication and information technology the adoption/disadoption process is known as *media substitution*. The introduction of a new medium encourages a restructuring of the way people perceive existing media. Media substitution occurs in two ways, through displacement and supplementation.

Media displacement occurs due to superior content, technical benefit, and cost efficiency (Lin, 2001). Television displaced radio because of television's visual capability. Audiences abandon old technologies and replace them with new ones when the latter is considered more functionally desirable. Thus, new media will displace functionally similar traditional media if people perceive that it is superior in function or content, less costly, or more convenient. Bum Soo Chon, Han Woo Park, Devan Rosen and I (2001) have suggested that the Internet is replacing traditional telephone because of its functional advantages, which include data transmission, asynchrony, and cost.

While Kayany and Yelsma (2000) found displacement effects of online media on the use of television, newspapers, and family conversation, many studies, however, did not provided support for time displacement due to the functional equivalence of other media. Internet users do not appear to experience displacement. Studies have shown *media supplementation* in which the adoption of new media increases the time spent with older technologies. This depends, of course, on whether the new information technology is "functionally similar" to those already in use. Media technologies rarely become extinct; they typically endure by improving or updating their content offerings or delivery system, such as the case with high definition digital radio and television.
As a media technology, Internet-based social media provides an additional, more convenient and affordable channel of communication to supplement the telephone, face-to-face contact, and traditional mass media. Among its initial adopters, traditional media use was not significantly related to Internet use. Further, Internet users more frequently use other media and engage in social activities than nonusers. They read more literature,

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attend more arts events, go to more movies, and watch and play more sports. However, the relationship between use of new media and old media differs by user characteristics. Internet use was associated with greater use of print media among users who had been early adopters. They were wealthier and more highly educated. Over time, this relationship has disappeared among later Internet users.

In a recent study, Yoonjae Nam and I (2010) examined the longitudinal trends in Korean use of domestic and international mail, domestic and international telephone, telex, mobile telephones, television, and the Internet to determine the various media's displacement and supplement effects. The results show that international mail, domestic telephone, and telex use is being discontinued, while the trends for domestic mail and international telephone calls show exponential growth or adoption. Correlations indicate that the new media have displaced international mail, domestic telephone and telex, yet they do not substitute for domestic letters or international telephone calls. Finally, television, mobile telephones, and the Internet are at the exponential or logistic growth stage of diffusion and supplement each other. Thus, one can conclude that the various media interact in a variety of ways. The new media can replace existing media by performing the same functions as the old media, or they can complement the current technologies by supplementing their role in the communication process.

The Evolution of Social Media

Along these lines, Matt Weber and Peter Monge in an entry for the forthcoming *Encyclopedia of Social Networks*, examined the evolution of SNS from the perspective of Organizational /Network Evolution Theory beginning with the notion that SNS represents a new organizational form and then describe the development of variation among the various websites, and which of these services/companies/website are related through the use of the organizational community (the community of Internet users).

This raises the question, how will the social media evolve in the future? I fully expect them to become extinct, that is, their use to be discontinued or altered in a number of ways as to render them unrecognizable as the Facebook or Cyworld of today. Newer media that are superior in functionality or content, more cost efficient or more convenient will displace today's social media. In fact, recent data from *Alexa.com* (2010) show an overall decline in the use of social networking sites, including MySpace, Classmates.com, Linkedin and Cyworld. For example as can be seen in Figure 1, Cyworld had a 22% decline in the number of page views per user and a 13% decline in the number of minutes of time per site visit over the last three months. Between the middle of 2008 and the middle of 2009 the number of pages viewed per person was between 18 and 20. Today, the average number of pageviews per visit is about 8. The time on Cyworld was about 20 minutes per visit in 2008, peaking in January 2009. Today, it is under 6 minutes. This is shown in Figure 2.

The same trends hold for Facebook although not as dramatic. Over the last three months, pageviews declined by over 6% to about 13 per visit. Time spent is also declining. Perhaps more importantly, the demographics of Facebook users are changing from students to older woman, who are traditionally late adopters (Rogers, 2003). The early adopters are moving on to other media.

Figure 1
Time on Cyworld

Figure 2
Cyworld-Daily Pageviews per User

Also, in spite of all the attention that Twitter has recently received, its use has also declined over the last year and a half from over 10 pageviews per user to about six and a half and the time on the site from 10 minutes a day to less than eight. Over the last three months, pageviews per user have remained constant and minutes up slightly.

How social media is studied

Ellen Wartella and Byron Reeves (1985) have written that when new media (books, newspapers, cinema, radio, comic books (what we today call graphic novels), and television) are introduced, social debates regarding their potential to alter society, whether utopian or dystopian, how they are used and their effects have reoccurred. Scholars study new media as they have examined older forms of communication in the past. That is, earlier research sets the agenda for the future. These strategies for studying media as a social problem have transferred from one epoch's popular medium to the one that supersedes it.

For example, Leslie Haddoon and Shin Dong Kim (2007) have described how people, mostly women, use Cyworld to strengthen their relations within their preexisting social networks. Jang, Youn and McClung (2007) have described how people, again mostly female students and young professionals, use Cyworld for self-expression and the reasons for its use-- entertainment, self-expression, professional advancement, passing time and communication with friends and family from the traditional uses and gratifications perspective.

But what has research on social media taught us about the process of communication and the role the media plays in society? As social SCIENTISTS our goal is to formulate and evaluate theories about human cognition and behavior, not simply to describe how individuals use a particular medium. We want to predict and explain and perhaps control the general process of communication, not simply develop theories specifically tied to the current social media.

What Have We Learned from the Study of Social Media?

Let me restate the question, what have we learned about human communication through the specific study of social media? I asked Joe Walther, perhaps the leading scholar of computer mediated interpersonal communication, this question. He suggested five things we have learned from CMC research.

Humans like to be known.

Despite a lot of early Internet hoopla about how visual and auditory anonymity would allow people demographically unidentified, people have found ways to use language markers (phrases, style, spellings) to signify gender, race, and other characteristics. A good deal of this could be from people looking for complementary others online to become friends with, but it is clear that people like to signify social identifications and personalities, even when they have the option (via CMC) not to do so.

Code systems are fluid.

Much of the literature about communication suggests that nonverbal communication has a monopoly on the expression of emotion and affect, liking, attention and turn taking, and leadership/charisma. The CMC literature makes the same assumptions. It turns out not to be the case. As is the case that blind people rely on auditory cues more, it seems to be that when people are unable to use the full range of nonverbal cues, language is made to do the job that the body and voice do when they are available. There is no evidence that there is a loss of fidelity, although some evidence suggests that time and ef-

fort requirements are significantly greater when one must use a single cue system rather than multimodal speech.

People are communicative misers.

People express a preference for face-to-face over mediated communication (when both options are available and the communicative task is not especially benefitted). So even though CMC is objectively as effective, it is perceived as being less effective than face-to-face, we suspect, simply because it takes greater effort.

People trust and like rule-followers.

Research on virtual groups examined whether a number of rules for communication effectiveness (e.g., write frequently, be explicit) helped virtual groups. Interestingly, there was little correlation between people's reports of their own adherence to the rules, with various outcomes. But the extent to which their group partners followed the rules was strongly correlated with trust, social attraction, and the quality of their work. This may be truer in the virtual environment than in the physical, but it is likely to transcend media.

People like to reduce vulnerability in risky interpersonal ventures.

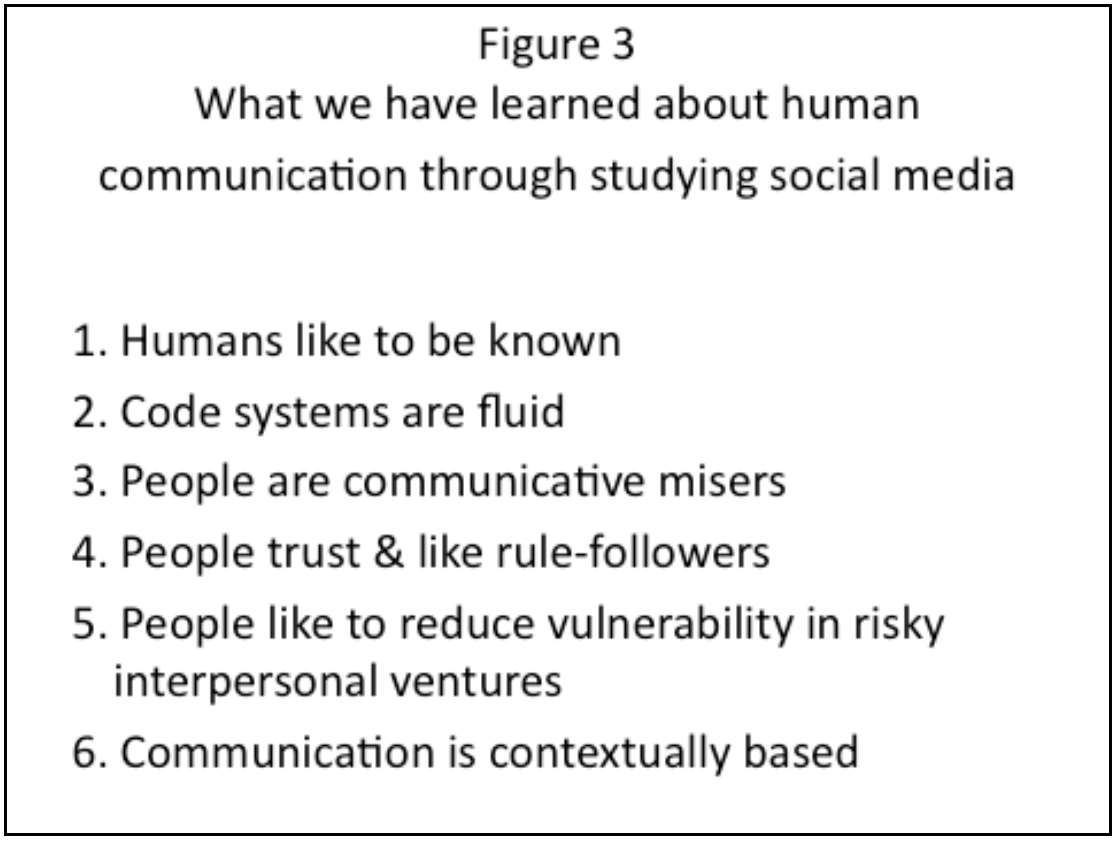
Online dating systems allow individuals to mitigate anxiety and embarrassment for suitors when they find themselves rejecting requests for dates.

Please note that Professor Walther's response is not explicitly about social media, where the interactants are generally known to each other, and pictures and video are commonly used. In Cyworld, even music is posted on ones minihomepy to communicate emotion. It is perhaps because of these functional advantages that SNS have replaced other forms of CMC for interpersonal communication.

Let me suggest a sixth thing that we knew prior to the diffusion of SNS but their adoption and widespread use has made explicit.

Communication is contextually based.

People are structurally embedded in social networks. Traditionally, a great deal of communication theory has focused on persuasion and compliance gaining. Most of this research has used laboratory experiments to determine message effects in order to test various theoretical propositions. Generally, this research ignored social context and the process of social influence by individual actors that compose ones social network. Recent research on Facebook (Stefanone, Lackaff & Rosen, in press; Wang, et al, 2010), the blogosphere (Park & Jankowski, 2008; Park & Thelwall, 2008; Laser, et al, 2009), hyperlinked web pages (Kim. Barnett & Park, 2010) and Twitter (Smith, 2010), focuses on how one's structural embeddedness determines the information people receive, and therefore their behavior. That is, research has attempted to answer the question of how one's position in the SNS determines how politicians vote or ones participation in altruistic, mob or political activities. What we have learned from the study of computer-mediated communication is summarized in Figure 3.



This discussion is not meant to imply that we haven't developed new methods using the new social media, but methods are not theory, or that the new social media haven't changed society and the world as we know it. They have. But, what has all this research on Facebook and Cyworld, blogging, and Twitter contributed to our understanding of human communication and society?

Danah Boyd and Nicole Ellison in their 2007 review of the research on SNS conclude that,

> **…**the available research suggests that most SNSs primarily support pre-existing social relations…. networked practices mirror, support, and alter known everyday practices, especially with respect to how people present (and hide) aspects of themselves and connect with others. In Korea, Cy-world has become an integral part of everyday life—J.H. Choi (2006) found that 85% of respondents "listed the maintenance and reinforcement of pre-existing social networks as their main motive for Cyworld use.

The new media do provide social and information scientists tremendous opportunities to evaluate existing social theory due to the large number of people interacting and conducting financial transactions over the web. For example, prior to the Internet there were an insufficient number of auctions to test theories about the role of common and individual value in the bidding process. Arun Vishwanath and I were able to test certain economic theories about auctions through data mining eBay's website.

Also, research on the social media has forced social scientists to challenge existing models of communication. For instance, birthday messages on one's Facebook Wall are an interesting combination of directed interpersonal communication, and public mass communication. Studying these hybrid forms of communication would enable us to further develop these models in potentially interesting ways. Clearly, our understanding of the process of political communication is changing dramatically as a result of social media.

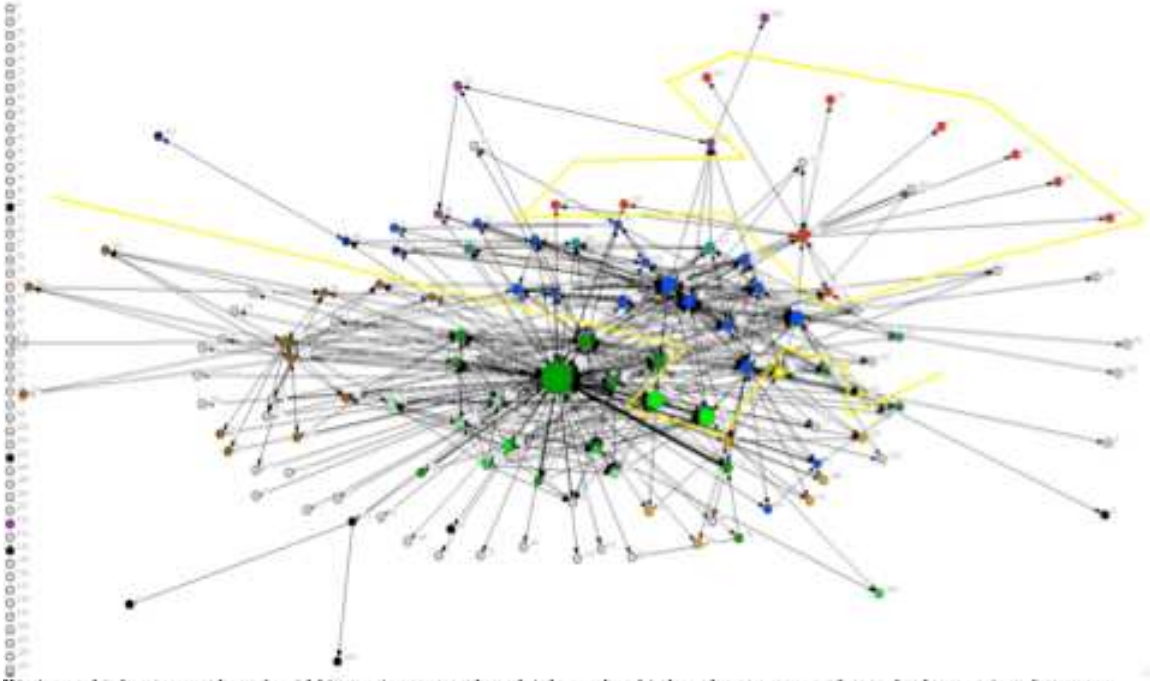
Or is it? In a recent article the New Yorker, Malcolm Gladwell (2010) debunks the notion that Facebook and Twitter were responsible for the 2009 social activism in Moldova to protest against the Communist government and the student protests that rocked Tehran. These events were the result of traditional social organizing not "outsized enthusiasm for social media".

International Telecommunications Networks

The primary focus of my research has examined international telecommunication networks and their role in the process of globalization over the last 30 years. What have I concluded? From the perspective of World Systems Theory, the structure of global communication is quite similar to the structure of international trade. That is, the change in the means of production of wealth from an industrial based economy to an information based one has not altered the structure of the world's economy. The global network is constructed as core–periphery with regional clusters. The core consists of China, Continental Europe (Germany, France, Italy and Spain), North America (U.S., Canada and Mexico) and English-speaking countries (U.K. and India) with extensive ties among them. Korea, incidentally, while it has ties to China is more closely tied to North America. Toward the periphery are regional clusters in Latin America, the Arab world, Africa, Southeast Asia, and one composed of the former Soviet Republic with links to the core. Wealthier countries from the peripheral groups are closer to the core and consistent with WST and represent the semi-periphery. For example, Saudi Arabia and U.A.E. are the most central Arab countries, Brazil is the most central South American nation, and Russia has the greatest number of ties within its grouping to the core. The structure of the global telecommunications network is presented in Figure 4.

Over the last 30 years, globalization has taken place slowly. The network has become denser at a rate of .9% per year. The trend in density, however, has not been monotonic. While the network became denser over time until the mid-1990s, with the greatest increase coinciding with the breakup of the Soviet Union (Barnett 2001). Then, it grew sparser through the beginning of the century. This is may be attributed to the reintegration of Hong Kong into China and the city's weakening ties to the U.K. (Barnett, 2004). Since 2000, density has been relatively stable (See Figure 5). Also, for the last 12 years there has been a small but steady increase in the concentration of international telephone flows within the core suggesting that the network has become more centralized. What has changed, consistent with World Systems Theory, due to the decline in the cost of international calling and the diffusion of inexpensive mobile telephones is that expatriate workers call home more frequently.

Figure 4
International Telecommunication Network



Minimum link strength = 1 million minutes; the thicker the link, the greater the telephone time between countries. The diameter of the nodes indicates their relative GDP.

Hanwoo Park, Chungjoo Chung and I (in press) have found a similar structure for the international hyperlink network. This is shown in Figure 6. The core of the international hyperlink network consists of the U.S., U.K., Germany, France, Italy, Japan, Canada and Spain, with regional clusters for South America, Chinese East Asia, and the former Soviet Union. Again, Korea is more tightly tied to the United States than any other country.

We examined over 9.3 Billion hyperlinks among 33.8 Billion sites from 273 TLDs using Yahoo and LexiURL Searcher, a social science web analysis tool developed by Michael Thelwall (2009). In 1993, when Hanwoo and I (Barnett & Park, 2005) last examined international hyperlinks, we analyzed just over 350 million links among 550 million websites from only 47 countries, which constituted 98% of Internet traffic. Isn't Web Science wonderful? It lets one work with truly large data sets, where measurement error is actually randomized.

Figure 5
Globalization

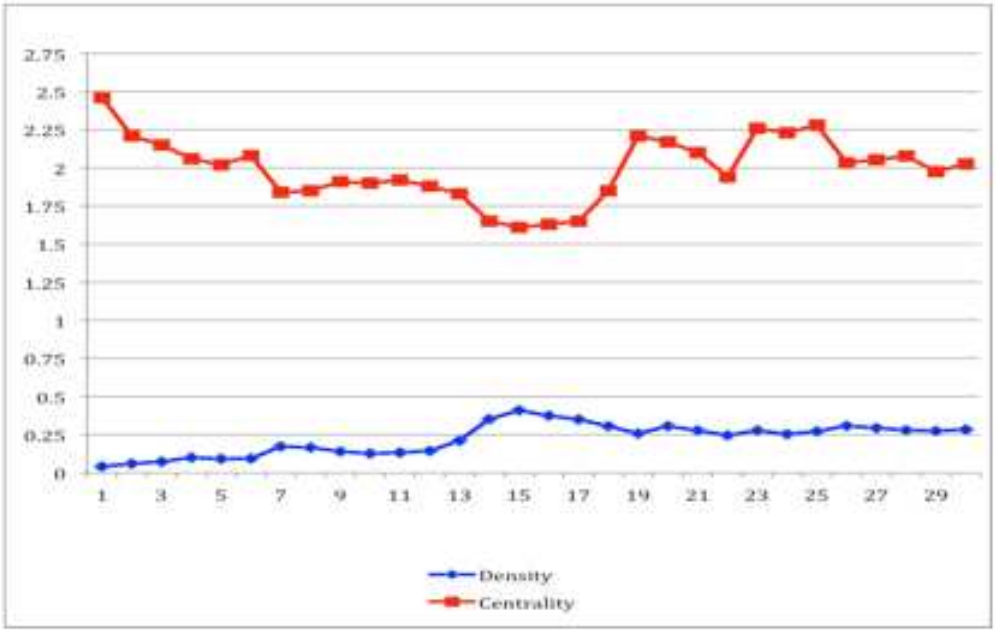
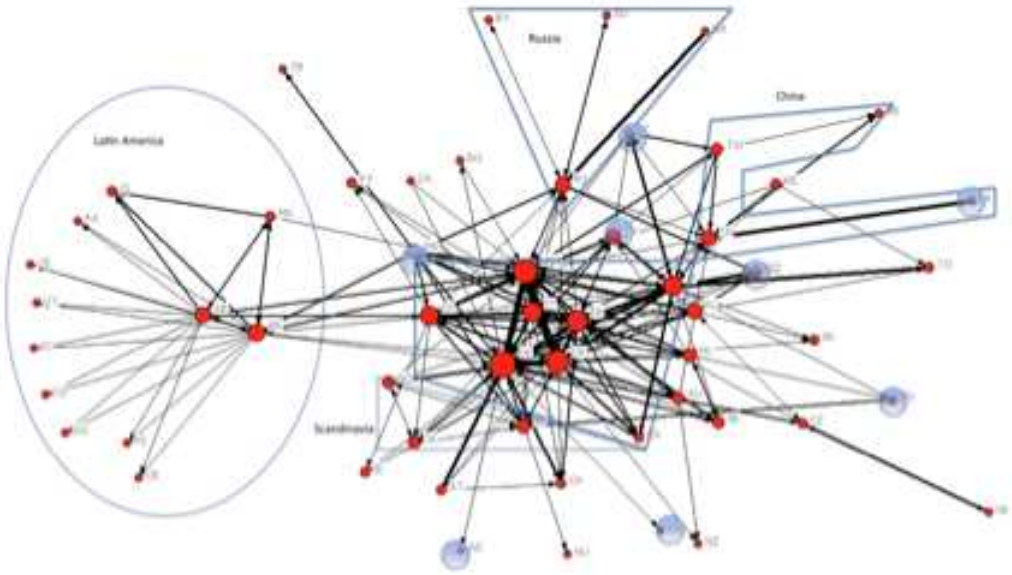


Figure 6
International Hyperlink Structure-2009



.com, .net & .org not included; 33.8Billion hyperlinks

So, why did I discuss my telecommunications research in the context of a speech to scholars whose research focuses on social media? The reason was to point out that the study of new communication and information technologies need not, and should not focus on the technology itself, but rather on the development and testing of social and communication theory that is facilitated by these new media of communication. Note that my primary interest is on the structure of what Marshall McLuhan called the global village, and others, the global community, or the web of nations. How does this network, which constitutes the world system, change over time as a function of the information that flows between nations? This is what we have come to call globalization.

Cultural Convergence Theory

Underlying my research is a theory first proposed by Everett Rogers and Larry Kincaid (1981), cultural convergence theory, which argues that over time actors (individuals, groups or nation-states) in a closed system (the world system or global community) will converge on the average collective pattern of thought (culture) if communication is allowed to continue indefinitely. Thus, cultural convergence theory predicts that all participants in the world system will converge over time on the average collective pattern of thought (a global culture) if communication is allowed to continue unrestricted.

The structure of telecommunication and Internet flows represent the restrictions of the flows of information among nations. Unlimited and unrestricted communication between cultures will eventually lead to a reduction in the differences between cultures and toward greater similarity of values, with the equilibrium value tending toward the average of the collective that is expressed in the exchanged messages. Cultural convergence can only be delayed or reversed by the introduction of new information and/or the formation of boundaries that restrict the flow of information. Relatively bounded isolated groups experience greater convergence toward their own local system rather than the larger global system, even though the net convergence of the entire system will continue to increase. These separated groups may be identified through network analysis, the methodology I use to describe the world system.

Later Larry and I (Barnett & Kincaid, 1983) developed a mathematical model for convergence theory, and provided an initial test of the theory through the examination of Korean immigrants in Hawaii (Kincaid, et al, 1983). More recently, Devan Rosen and I reformulated the theory in light of the evidence in support of hybridization, advances in the study of communication networks and research on international telecommunication networks (Barnett & Rosen, 2007). Previous discussions of convergence theory had not taken into account differences in the strength of ties among the actors in social networks. The study of telecommunications networks operationalizes the strength of links as the number of messages exchanged or the frequency of communication. The issue had not been addressed at the time convergence theory was formulated because network theory was restricted to dichotomous measures (link-no link). Today, more sophisticated methods of mining the web allow for the consideration of the measured strength of links.

Also, not addressed by the theory was the difference in directionality, where one actor initiates the interaction a greater proportion of time. What are the differential impacts of encoding and decoding information? This issue was not addressed because communication had been defined as a sharing of information among equals rather than considering difference in power among the actors.

Thus, two additional propositions have been added to convergence theory: 1) the stronger the link between actors, the greater their reciprocal influence. Thus, the faster they converge on a common set of beliefs. 2) The greater proportion of messages initiated by an individual actor, the more similar the final equilibrium set of beliefs will be to the expressed state of beliefs. Thus, in the long term global culture will be most similar to the nations encoding the greatest proportion of the system's messages.

Currently, that is the United States and the other nations at the core -- U.K., Germany, France, Italy, Japan, Canada and Spain. But the structure of the international information flows is changing over time. China and India have become more central and continental Europe less central. Regional groupings with a greater concentration of communication within their cluster than to the world community, have developed. This is the case for South America, Chinese East Asia, and the former Soviet Union and represents one aspect of cultural hybridization.

Conclusions

In conclusion, please don't understand me to be saying that you should not study social media. You should. These media provide extremely rich data that present tremendous opportunities for the development of sophisticated new methods for the formulation and testing of theories about human communication, which after all is the goal of Communication and Information Science.

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