Network Nation: Human Communication via Computer

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In 1978, some of my current graduate students were born, and like more than 99% of the world's population, I had never used a computer to communicate with another person. That year, Murray Turoff, a computer scientist at the New Jersey Institute of Technology, and Starr Roxanne Hiltz, a sociologist then at Upsala College, published a visionary book on communicating through computers. A few years later, their book, *Network Nation: Human Communication via Computer*, would help set my research and life off in a new direction. My dog-eared copy of the book has disappeared from my office, and I must borrow Jane Siegel's copy. Her book is stuffed with little paper notes that say, "Xerox pg. 15, 27-28, 30." Jane and I published several articles together; these faded notes are some of the evidence of the influence of this book on my own work.

Network Nation is a combination of research report and insightful policy analysis. For its time--pre-personal computer, pre-AOL, pre-Web--it was prescient. Teresa Carpenter said in her Village Voice review in 1993 that the book laid out "a future when home computers would be as common as the telephone, when they would link person to person, shrinking. . . 'time and distance barriers among people, and between people and information, to near zero.' In its simplest form, the Network Nation is a place where thoughts are exchanged easily and

democratically and intellect affords one more personal power than a pleasing appearance does. Minorities and women compete on equal terms with white males, and the elderly and handicapped are released from the confines of their infirmities to skim the electronic terrain as swiftly as anyone else."

The book was not mere lofty Net dreams. In 1971, its computer scientist author, Murray Turoff, designed and implemented the first virtual team—a computer conferencing system, called EMISARI, for Delphi decision making for the Office of Emergency Preparedness. He later designed EIES, a conferencing system to support scientific discussion. EIES was an infrastructure for a virtual online community, consisting of what we now call chat (synchronous communication), discussion boards or forums (asynchronous messaging), and customized news. In 1975, Starr Roxanne Hiltz, a sociologist, began reporting on the effects and social impact of the computer conferencing systems the team was testing. Together, through careful and voluminous documentation of their field tests and experiments, the interdisciplinary team of Hiltz and Turoff defined key problem areas in computer-mediated communication and Internet research that remain today. They were perhaps the first to argue that "to understand computer-mediated communications at all, you must see them as a social process (pg 27)." They grappled with questions of how to create online community, and they noted the paradox that, "although the medium seems inherently impersonal, there have been many cases observed or reported by the participants of the most intimate of exchanges taking place between persons who have never met face-to-face and probably never will (pg 28)." They also raised enduring questions about how to manage distributed work teams, what to do about free riders in online groups, addiction or dependence, and information overload (e.g., Thompson and Coovert 2006).

How did a social psychologist like me, whose dissertation topic was "gratitude" end up reading a techie book like *Network Nation*? I owe something to President Reagan, whose freeze on social science NSF projects led to my doing some catch-up reading, including Murray Turoff's (1972) paper on Delphi anonymous online decision making. The federal government had supported Murray's research to make decisions more accurate by removing social pressures on the group through computer conferencing. Then Hiltz and Turoff would publish new work marking a change in their thinking. Jane Siegel found the *Network Nation* book and we read it avidly. It wasn't just technology; it was about people who seemed to be forming meaningful groups using computers. Here is a discussion in *Network Nation* that moved us to run our first experiment:

> The emphasis in designing [computer conferencing systems] has been to maximize the amount of task-relevant information that can be shared among the members of a group, while still keeping the medium as 'comfortable' as possible. Those who are most enthusiastic about the potential advantages of this form of communication tend to focus on this characteristic, as reported, for instance by Johansen, Vallee, and Collins (1977, p. 3).
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> Computer-based teleconferencing is a highly cognitive medium that, in addition to providing technological advantages, promotes rationality by providing essential discipline and by filtering out affective components of communications. That is, computer-based teleconferencing acts as a filter, filtering out irrelevant and irrational interpersonal 'noise' and enhances the communication of highly-informed 'pure reason'—a quest of philosophers since ancient times.

At that point Hiltz and Turoff questioned whether computer conferences were impersonal, and whether they would really promote "pure reason." In their conferences, they had found that people felt "free to be extremely frank and open with one another, whether discussing a topic such as a scientific or business problem, or in exchanging information about themselves and their feelings (p. 28)."

They offered examples, "At least one case of a dyadic relationship in which two persons are fairly friendly and cooperative in face-to-face meetings, but in which disagreements and hostility soon surface when they communicate by computerized conferencing," and "A young woman who exhibited signs of schizophrenia or other severe personality disturbance, communicating in grunts, nods, and monosyllables in a face-to-face condition; within ten minutes of being introduced to CC, she was sending a constant stream of long messages, all signed 'anonymous' (pg 102)." Hiltz and Turoff wrote, "These observations and speculations are offered to suggest our extreme ignorance in this area. We know there are personality factors. . At present we have only the skimpiest of insights into what these factors are."

I was trained in the Kurt Lewin tradition, which assumes social forces in all groups. Might there be such a thing as an impersonal group? My background as an experimental social psychologist made running a controlled study an obvious option. Jane Siegel and I decided to compare three-person decision making groups that would work face-to-face and remotely with computer-mediated chat. We hired Mina, an undergraduate, to run a pilot study. Mina quickly proved a disaster, or so we thought. Her face-to-face sessions were fine but her computer chat sessions were a mess. One of her first groups was not able to reach consensus until 2am in the morning. Subjects were getting upset with each other, refusing to reach consensus. We went back

to training, and asked Mina to follow a strict protocol and to wear more formal clothes so subjects would "take the experiment seriously." We continued to see problems in reaching consensus when participants used chat.1 Lee Sproull suggested I talk with Allen Newell. He told me, smiling, "Oh, that's just flaming." Jane decided to run the experiments herself, and we began to document carefully the processes that ensued when people had to reach consensus using the computer to communicate. With that began a new program of research, soon leading to a new NSF grant, field studies with Lee Sproull, a new focus on email, and many new and wonderful colleagues.

Roxanne Hiltz had run pilot studies prompting new ways to think about computer-mediated communication. In *Network Nation*, she and Murray described a pilot study of group problem solving in which Roxanne calculated an index of inequality of participation in these groups, reasoning that computer conferencing might reduce the impact of stigmatizing physical attributes (p. 111). Thus we measured inequality of participation in our studies, and later explicitly tested the impact of social status in face-to-face and computer mediated groups (Kiesler, Siegel, & McGuire 1984; Dubrovsky, Kiesler, & Sethna 1991).

To give a further sense of the prescience of Hiltz and Turoff's observations and ideas, and the indirect and direct influence they had on me and others, let's take a look three other examples:

Example 1: Anonymity

In Murray Turoff's conferencing systems, participants could choose a pen name, a real name or decide to be anonymous. Hiltz and Turoff wrote, "The motivation of the sender of an anonymous message or conference comment is self-protection. However, anonymity can have some very important social consequences for the groups. As [one of our conferences] points out. . the use of

anonymity can promote interaction, objectivity, and problem solving. . e.g., one would not have to worry about unpopular ideas, etc. (pg. 95)."

These observations led us to ask in our 1982 grant proposal, whether "anonymity caused by difficulty in [identifying] speakers, poor resolution of physical detail, and use of 'alias' options, might prove significant in affective responses," and we raised the matter again in our 1984 American Psychologist paper (1984). Anonymity later became a primary factor in SIDE theory (Postmas et al. 2005).

Example 2: Flaming and Candor

Hiltz and Turoff quoted from their logs to demonstrate candor in computerized conferences. Here is one from 1975:

> NUMBER 9269 BY CHARLES AT 1619 ON 11/02/75
>
> well I for one am particularly concerned. . .Come on Iris if you want another conference. Open it up. Don't fuck around with supposedly private ones. . .We hae enough problems with out adding to them. Remember I did not sign that promise not to get pissed off at you. (p. 127)

These examples (and Allen Newell's remarks) helped us understand that our observations were perhaps not a fluke, and we made a big point of the "openness" argument in our Sproull and Kiesler (1991) book. Lee and I discussed how people could at once express feelings they might not express in face-to-face discussion, and also take on different personas or personalities

in different online groups. The reasons for this behavior have since fascinated many researchers, and the issue persists today, not just at the margins of HCI but in the core disciplines (e.g., Kruger et al., 2005).

Example 3. Community and citizen participation

Hiltz and Turoff foresaw that computer communication would enable people to self-organize without the aid of officials or formal organization: "Often citizens feel at a disadvantage when participating in the political process because they do not have access to the same knowledge and expertise that government officials and industrial or business groups have.. . Computerized conferencing would make it possible for citizen groups in different areas to pool the technical and professional talent available to them. This pooling would at least provide the opportunity for citizen groups to get better handles on facts available and the opportunity to take well-informed positions on complex topics. This would lessen the likelihood that well-meaning citizen groups would take unreasonable positions because of a lack of knowledge. (p. 200-201)." They foresaw the use of citizens to organize during disasters and even to vote.

We agreed with these possibilities for online community in *Connections* (1991). Today, with technical reality catching up to Hiltz and Turoff's vision, the ideas permeate HCI and CSCW (e.g., Preece 2000; Postmes and Brunsting 2002).

In 1994, the Elecronic Frontier Foundation presented its annual pioneer awards to Murray Turoff and Starr Roxanne Hiltz. I could not say it better:

> Murray Turoff and Starr Roxanne Hiltz are key innovators and the premier theorists of computer-mediated communications. Turoff and Hiltz . . . helped define the electronic frontier: The Network Nation. The term we currently use for online

discussions, "computer conferencing," was popularized by Turoff almost a quarter-century ago. The term was no metaphor--it was a literal description of what they had built in the EIES ("Eyes") system -- that is, a system that allowed people to "confer" via the computer. Hiltz's notion that computer conferencing could form the basis of communities is a concept that increasingly dominates popular discussion of online conferencing systems. Hiltz and Turoff forecast most of the common uses and conventions of online conferencing systems that we see today.

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Note

[1] A meta-analysis of 36 experiments showed that computer-mediated groups had a harder time reaching consensus than face-to-face groups (Baltes, 2002).