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ABSTRACT

The essays in this volume explore the ways the Speech Communication Association (SCA) might use the computing technology of the microprocessor. The six chapters focus on the following topics: (1) ways the new technology will impact on the processing of manuscripts for speech journals and the SCA's national conventions, with particular emphasis on the role of teleconferencing, electronic mail, telemarketing, and polling; (2) the kinds of information utilities currently available that might be of particular use to members of the SCA; (3) the results of a survey conducted in 1984 to locate members who use the computer in their work, and the scope and extent of that usage; (4) methods by which to assess the value of computer assisted instructional materials; (5) computer simulations and ways to implement their use; and (6) some of the consequences of either failing to recognize the value of the microcomputer or of attributing to it human or, worse, superhuman qualities. (HOD)

MICROCOMPUTING IN SPEECH COMMUNICATION:

A REPORT OF THE TASK FORCE

ON USE OF COMPUTERS

Edited by

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1985

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Preface

Frank E. X. Dance

Writing radically affected human individuals and human society. Writing changed the ways in which humans used their intellects--change in our use of memory is but one aspect of the overall revolution wrought by writing. Writing also changed the ratio of human sensory utilization.

Computers, in their technology and in their usage, are also well on their way to effecting a similar revolution in human information processing and in human communication. The measure of this computer revolution is yet to be taken. The changes being wrought in us by our new invention are too subtle and too profound to be immediately obvious. But such changes there are.

Scholars in the field of speech communication, whatever their scholarly emphasis, are obliged to attend to the effects of computers on the means and manner of human communication. We have the responsibility of trying to assess computer induced changes as they bear upon human communication and spoken language. This compilation of essays prepared by members of the original Speech Communication Association Task Force on Computer Applications is among our profession's first efforts towards assessing and understanding such changes.

These essays are just the beginning. As we become more familiar with the composition and the applications of our electronic prosthesis more essays will be forthcoming. Whereas these early essays of necessity focus upon relatively broad survey topics, future essays will undoubtedly probe deeper relationships between the computer and the communication of human beings.

Professor H. Wayland Cummings and the University of Oklahoma Department of Communication deserve our gratitude for underwriting in time and money this publication.

Frank E. X. Dance
Founding Chairman (1982)
Speech Communication Association Task Force on Computer Applications

Introduction

H. Wayland Cummings

When Frank E. X. Dance was President of the Speech Communication Association in 1982, he appointed a task force to determine ways the association might use the computing technology of the microprocessor. The task was to explore the technology, and the financial and human resource requirements to maximize the use of the information revolution by the Speech Communication Association. A proposal was to be prepared and submitted to the membership for consideration of its adoption. The five chapters of this monograph represent the fruition of that effort. The chapters were originally presented to a special conference of the SCA Task Force at the National Convention held in 1984 in Chicago.

The first chapter, entitled "Networking of the Speech Communication Community," represents the heart of the proposal, exploring the properties and capabilities of a national network of scholars in our field. H. Wayland Cummings of the University of Oklahoma explored ways the new technology would impact on the processing of manuscripts for our journals and our national conventions. Particular emphasis was placed on the various types of networks which require consideration by the field at the local, regional and national levels, and how these networks may help us carry on the work of the discipline. Other transactions, including the role of teleconferencing, electronic mail, telemarketing and polling, also were discussed. Numerous proposed SCA data bases were identified, including the placing of Matlon's Bibliograhic Index on disk along with many of the features currently reported in SPECTRA. The value of Placement Services, and a national telephone and address book also was described. A specific proposal to begin networking of the field was offered.

Frederick Williams of the University of Southern California describes in Chapter 2 the kinds of information utilities currently available which might be of particular use to members of the Speech Communication Association. He describes eight utilities, including The Source, CompuServe,

Dow Jones News/Retrieval, Delphi, BRS/After Dark, Official Airlines Guides--Electronic Edition, MCI Mail, and NewsNet. He presents examples of ways people may interact with these utilities, and provides addresses for those seeking further information.

The SCA Task Force believed it was necessary to conduct a survey of its membership, exploring current uses of microcomputers. Leanne O. Wolff of Heidelberg College (Ohio) reports in Chapter 3 the results of a survey conducted in 1984, the purpose of which was to locate members who use the computer in their work, and the scope and extent of that usage. The survey represents the most complete survey of SCA membership on its use of microcomputers up to this time.

Timothy Ashmore of Eastern New Mexico State University, current President of the SCA Task Force on Use of Computers succeeding Frank E. X. Dance in November of 1984, reports on methods by which we might assess the value of Computer Assisted Instructional (CAI) materials. Ashmore reviews a number of published evaluation forms and argues that the field of Speech Communication Association must find rationally-based ways of evaluating the usefulness of computer programs for instructional purposes.

Computer simulations is an area which has seen relatively little use in Speech Communication, although a few studies have been found which do use the technique to understand complex relationships in the communication setting. Thomas R. King of Florida State University provides an extensive review of the literature, and a bibliography on the value of computer simulations. Although he finds that people in the field are generally not using this approach to theory development and decision making, he recommends that we encourage computer simulations and offers a five-part effort to implement its use.

Vernon W. Gantt of Murray State University (Kentucky) completes this monograph by asking all to remember the human component in the use of microcomputers. He explores some of the consequences of those who fail to recognize the value of microcomputers. He also points out that those who fear its use may tend to treat the "machine" superstitiously, ascribing human motivation to a machine.

Our intent in the preparation of this monograph is to elicit a conversation in the field of communication regarding the role and value of the computer revolution. We believe there is an inertia which characterizes all of us, keeping us from carrying out the kind of effort which leads us with optimism to embrace the information revolution now upon us. We believe it important that the field come to an affirmative decision to take part in the networking of the discipline. To do less is to fail our responsibilities in keeping this a vibrant and growing field of study. We hope this monograph will have contributed to this effort, and become only the first voice for change in the acceptance of the "coming information age."

Chapter 1

Networking of the Speech Communication Community

H. Wayland Cummings

Dizard (1982) painted a breathtaking picture of the "coming information age" in which he cited the capability of any person of average intelligence having access to mountains of information stored in data banks anywhere in the world. He argued that a "full-scale information network will break the old constraining bonds of limited access to information resources," long the perview of a few elite "Einsteins" who had unusual powers of concentration. It would seem that the micro-computer, tied to data bases anywhere in the world, represents at least a partial "democratizing" of knowledge.

Dizard describes this new condition as "distributed intelligence," making it possible for any who have the requisite "key" to the storehouse of knowledge to participate in the information revolution. Some have speculated that by 1990, two out of every three homes in America will have a home computer. The "wiring" of America has already begun, with numerous services available such as the ability to query library holdings; to bank; to get news, weather, and sports; to make your airline reservations; to shop; to transfer funds; to conduct or participate . polls; to download speciality programs, and even to talk to your stockbroker. In general, the personal computer serves as an extension and enhancement of human intelligence, making information available quickly at any point in the world.

The critical question for us, however, is how might the existing or near-future network technology assist us in carrying on, or even extending, the work of the community of scholars expressed in the Speech Communication Association. I shall address what I believe to be important properties and capabilities of a computer network, followed by some contextual issues and appropriate assumptions for us should the Speech Communication Association decide to commit itself to a network system. I shall then outline what the SCA's Task Force on the Use of Computers has

recommended for adoption. Finally, I will present some conclusions which focus on the workability of our proposal.

Properties & Capabilities of Networks

Professional people have generally been quite slow to adopt new innovations such as the computing technology and the networking developments associated with it. Sevel (1984) describes the slowness with which medical doctors and hospitals are taking on the new capabilities of the information age. It would seem that for any community to make maximal use of the networking capabilities of microprocessing, a "critical mass" of participants are required. While this fact is important to any proposal we might make to the Speech Communication Association, we must now consider what we mean when we speak of "networking" the discipline and describe some of the possibilities should we make such a decision.

Networks are comprised primarily of five parts: (1) The hardware, which includes computers and peripherals; (2) network interfaces, which permit microcomputers to "talk" to others through a mainframe; (3) a master controller, which may be a chip or an expansion card in a local network, a hard disk drive, or a dedicated computer; (4) a network server, which is usually comprised of disk drives which carry the software necessary to make the network work and the various programs available to network users; and (5) the "wiring," which may be cables or telephone lines.

Networking requires very little capital investment by individuals to be a participant. It requires a microprocessor, which could be as little as a few hundred dollars, or the more sophisticated systems which cost several thousands of dollars. In addition, it requires a modem which encodes and decodes signals over the telephone line. And again, modems are relatively inexpensive, costing anywhere from less than a hundred dollars to as high as several hundred dollars. Some microcomputers currently have modems built in. It would also be necessary to have the communications software required to manage the various parameters required

for the use of the modem and the sending of electronic information at various speeds across the telephone lines.

It is also important in any successful network to have inexpensive telephone linkage systems which permit people to use national lines by making local phone calls. And, this is available through Tymnet, Telenet or any of a number of others. These networks are generalized kinds of systems, whereby numerous public and private organizations tie their mainframe computers to the network. Thus, you can access Delphi, CompuServe or The Source by way of Tymnet and use a code to indicate you are entitled to interact with one or the other of the systems. Information utilities use several mainframe computers, such as Vax 11s, and they maintain data bases for members to query, or provide numerous capabilities for exchanging messages with other members of the system. And they may provide gateway connections with data bases outside their own systems, including those associated with Dialog and Dialcom.

Networks are commonly used for three purposes: (1) The movement of text from any point to one or more other points anywhere in the world; (2) the conducting of electronic transactions between two or more points anywhere in the world; and (3) the retrieval of information as a service to the community and the members of that community.

Text Communication

Two general classes of texts are utilized in our profession. They are the movement of manuscripts from any of our members to editors of journals, from editors to readers/critics and their return, and from editors to publishers for final manufacturing and distribution to subscribers. For example, it is possible for one to submit a manuscript to Communication Monographs over a network as described above; for the editor to move that manuscript to any number of associate editors and/or readers for critical evaluation; to move the manuscript with recommendations for changes back to the author, and subject to the author's approval, to move that same manuscript to a publisher in such a way that the manufacturer need only enter appropriate editing markers for final production.

Such a process makes it possible to insert or delete quickly any changes required in the editing process. And, it makes it possible for a publisher to drastically reduce the time and costs associated with reentering the manuscript into their own computers for preparation for printing. Electronic movement of manuscripts is not only time efficient, but it is cost-saving. There are some technical problems in this process which are as yet unresolved in the industry.

A second class of texts which are utilized by our profession are the manuscripts represented in the convention papers, policy statements, and other materials which characterize the annual activities of our association. It is clear that we have a somewhat similar movement of text as we do when handling manuscripts for publication; that is, the writer submits a text to a person responsible in each division. It is then moved to critics who review and select those appearing on the convention program. Then the paper is distributed to those attending the meeting or to those who write the author(s) asking for copies.

There is little doubt that the adoption of existing network technologies would make these processes of moving text from one place to another more efficient. The long delays which plague the author who has submitted a manuscript to a journal could be reduced. Even more, the costly procedure of preparation of manuscripts for publication could be reduced through automating the process. Finally, existing technology permits the use of numerous software services to correct errors (spelling, grammar and/or style) which plague any work associated with text processing.

It is also clear that the use of networking would have an impact on the character of our conventions, including how we exchange scientific information. One does not seriously expect to get a detailed analysis in a 10-minute presentation of a paper that would take an hour to read. We all recognize the problem of presenting orally the amount of information associated with our research in a short time. We build in redundance by making tape recordings and promising to mail copies of our papers to any who sign and give a mailing address. The best we can hope is that our oral presentations will motivate people to read the manuscript.

Networking would permit convention attenders to read papers in advance, perhaps permitting us to exchange the traditional "reading" of papers for more of what we find exciting and meaningful in the information exchanges characterized by our action caucuses. Many have argued that networking might depersonalize relationships, permitting people to "talk" without leaving their home (Slatta, 1984). And while it is true that networking very well may alter the way we perform our daily work activities, any profession whose membership is so orally verbal as we will find something else to do with ourselves should we find it unnecessary to carry the obligation of 50 copies of each of our four convention papers to the convention. I seriously doubt conventions will be replaced by networks, as we need these interpersonal relationships derived from face-to-face meetings as we share, compete, and maintain our personal and corporate sense of identity. It is true, however, that networking could, and perhaps should, alter the way we conduct our business while attending our conventions.

Transactions

Four existing services seem to be important to the scholarly community: (1) Teleconferencing; (2) electronic mail; (3) telemarketing; and (4) polling.

Computing networks will not take the place of those telephone conversations which have characterized the exchanges of many of us. However, there is a real value in members of our various boards being able to participate in interactive conferencing in "real time." And there is a very real value for one to be able to send a message to someone else without "speaking in someone else's sleep." Some of us have difficulty sleeping at 3 a.m., and find it useful and meaningful to send messages to others who may read at their leisure. It is important to the coordination of our work that officers of various divisions be able to communicate regularly. Or, for that matter, that we can exchange information with people whom we don't know but who may share an interest on a topic of common concern. And we can maintain an electronic record of those exchanges, permitting us to review our "conversations" at future points in time.

With electronic mail, we can send "letters" quickly. We can send those letters to one person, or in a mass mailing to any number of people. And we can use the capabilities of a computing network for both telemarketing and polling of our membership. The SCA, or any publisher interested in marketing their books and equipment, could certainly find such a network as useful as Sears has found their's to be as they market through CompuServe's digital mall. And from time to time, it is important to determine the attitude quickly of those in the profession on SCA-sponsored programs, or to conduct votes on important issues within an interest group. All this can be done electronically. It can be done reliably, and with as much security as is required.

Information Retrieval

Numerous data bases are available through networks, including the Library of Congress, the University of Michigan's Dissertation Service, specific libraries, the SCA Directory and many more. Many of you use the Bibliographic Index, searching the 16,000 entries, literally "by hand" as you flip through the various categories to find those articles published in the numerous journals represented in Matlon's (1980) work. The categories developed by Matlon have never satisfied all of us, nor even himself. Numerous people have made suggestions to the executive secretary of SCA on ways to improve the index. And one of those ways would be to make the data in the index accessible by computer. As many of you know, such a data base could be searched by title, author, date, journal, subject area or any combination, making it possible to get quick, inexpensive and complete searches of those journals which represent a part of the work of our community. The method of searching the data base can be, and is best determined by the user, not the author.

There are other data bases which we do not have which might be quite useful to the discipline. For example, member-interest files whereby we could obtain a list of the people in our profession who are interested, say, in conflict management. Much of what we do in Spectra could be made available in this way, including education and research notes, availability of jobs, personals and even the credentials of those seeking jobs. Obviously, anything we

currently do in our newsletters could be handled more efficiently via such a network.

Contextual Issues for SCA Utilization of Networks

One of the exciting values of the microprocessor is that computing now is in the hands of the users. One need not be a special "guru" or "priest" to do computing. It can be done in everyone's own home, and it can be done cheaply. Because of these changes and many others not stated here, there are some meaningful contextual issues and assumptions which we believe are important.

1. Some work is better done individually on equipment personally selected. It would be quite impossible to get agreement from every member of the Speech Communication Association to purchase the same equipment. Indeed, it would not be desirable even should we find it possible. The technology changes so quickly that we could not afford to be locked into one brand of equipment. In 1981, for example, the Secretary of the Air Force/Public Affairs identified the IBM-PC and Compass Computer as the equipment of choice for an international network of public affairs officers around the globe. It was a five-year plan. Already the equipment selected at that time is outdated with newer and better equipment. And even with the power of military rank and status, individuals are buying the equipment they want, not what the authorities determine.

There are many who believe that the larger the computer, the better the computer. Networks contain the risk of forgetting that which makes the personal computer personal (Bonner, 1983). Bonner notes that the "power of today's personal computer does not come from their hardware and peripherals, but from the fact that they're personal. Institutionalize them too much and you are left with a weak imitation of a terminal system."

Each of us do certain things in idiosyncratic ways. And there are some things better done with the equipment and software we select. Selecting a computer and software is much like selecting a car; we have highly-individualized tastes and needs, and no single piece of equipment can or

will meet the needs of all of us unless we decided to press everyone into a single mold. Some of our choices are concerned with the feel of the keyboard, or the word processing software which is most like the way we have done things before. And many have personal file management systems which they have tailored to their own research interests, and which may require certain software and hardware to make it possible. The implications of these choices are that any network we devise for the Speech Communication Association must have the capability of hosting the widest variety of different microprocessors. Whether one uses an IBM-PC or a VIC 20, Word Star or Electric Pencil should be the choice of the user.

2. Some things are better done in Local Area Networks (LAN), i.e. in your own department. There are specialized programs which permit students to learn about small group communication by simulating various kinds of communication conditions. And it is often useful for colleagues in a Communication Department at a local college or university to participate in a LAN for the carrying on of day-to-day business. There also may be specialized data bases for such local networks. And finally, it may be useful for LANs to prescribe a range of specified kinds of equipment in order to share resources such as printers, hard disks, software, and other support equipment. The needs of a local community are not the same as those of a national network represented by the Speech Communication Association. The SCA should provide support for LANs, or at least not attempt to take the place of work best done in a LAN. The SCA should be able to promote the sharing of information that is specialized to LANs, but which may be highly useful to other colleges or universities in the developing of their own LANs. However, the SCA need not take on the requirement of maintaining any data bases peculiar to LANs, or make decisions which may restrict the degrees of freedom for those who have locally-defined needs and objectives.

3. Some things are better done in Expanded Area Networks (EAN), defined for their geographic and/or functional special interests. For example, there are specialized data bases and transactions that may be useful with municipal or state-wide networks. States may have specialized programs which serve the needs of special

interests such as in forensics, scheduling of events, or state-wide political issues impacting upon members of an EAN. Such data bases may encompass topic areas of more broad scholarly interest than our national association. For example, state-controlled teacher certification concerns to people in Speech Communication may require data bases for members of an EAN, but which may not represent a national concern in the study of communication. Such EANs, however, may impact on the pedagogy of communication in a given state or municipality. The data bases necessary to EANs are the concerns of those who participate in Expanded Area Networks, not the SCA.

An EAN may be needed for larger geographical levels, such as represented by the regional associations of Speech Communication. To the extent that our regional associations address needs not expressed in our national organization, we will find specialized needs for networks in each of the four regions. But again, any data base unique to those regional associations should not be the obligation of the SCA.

4. Some things are better done in National Area Networks (NAN) defined for their national and functional interests, including the kinds of things we do which are necessary to carry out our national identity. NANs are the business of the SCA. Some of our interests are political, involving federal legislation and lobbying. Functional networks may be appropriate for each of the task-related areas of our field expressed in our divisions (Forensics, Instructional Development, Interpersonal and Small Group Interaction, Interpretation, Mass Communication, Organizational Communication, Public Address, Rhetorical and Communication Theory, Speech & Language Sciences, and Theatre). Or in our sections on Elementary & Secondary Education, Community College, Senior Colleges and Universities, Applied Communication, and Student. Or in our commissions on Communication and Aging, Communication and the Law, Experiential Learning in Communication, Freedom of Speech, Government Communication, and International & Intercultural Communication. And other special interest groups might be those who are members of the Educational Policies Board, the Publications Board, the Research Board, and the Board of Finance. In any event, these are all national and functional concerns which can be served uniquely in NANs. Indeed, the purpose of this

paper is to support the need for the SCA to be organized into a National Area Network.

Recommendations of SCA's Task Force on Use of Computers

A task force was appointed in 1982 by then SCA President Frank E. X. Dance to develop a report dealing with the use of computers in meeting the SCA mission. Among the areas identified was the application of computer technology to the networking of SCA membership to data bases consistent with the mission of our organization.

If the SCA wishes to form a network of its members, permitting access to such data bases as Manton's Bibliographic Index, the SCA Directory, news and reports currently found in SPECTRA, the Placement Service with appropriate security controls, and membership lists including the interests and expertise of each member, start-up costs as of February, 1984, would be $10,000.00. This money would be required for preparation of special software to handle our data bases (estimated 200 hours of programming assistance), with the SCA retaining proprietary interests in the data bases. All or a portion of these initial costs could be earned by the SCA through a royalty charge to be discussed later. In addition, the SCA would need to purchase (if it does not already own them) a 1200-baud modem and communications software. Costs of these requirements would be approximately $800.00.

We believe that it is critical that the Speech Communication Association become a part of the information revolution. In order to do this, we propose that the SCA organize an information network, permitting easy access to such SCA data bases as an index to journals in communication studies, news information currently disseminated through SPECTRA, job placement information currently handled through the SCA Placement Service, the SCA Directory, electronic mail, electronic conferencing, and at some future point in time, the movement of manuscripts.

Specifically, we propose that the SCA should approve entering into a contract with Delphi, an information network

utility, to begin the important work necessary to the establishment of a national network of Speech Communication scholars. The selection of Delphi was made both for cost factors, the accessibility for members anywhere in the nation through Tymnet facilities, and its ability to function as a gateway for the SCA membership to other important data bases such as those in DIALOG and DIALCOM.

Delphi Features

Delphi is owned by General Videotex Corporation, and is based in Cambridge, Massachusetts (3 Blackstone Street, Zip 02130, Telephone 617-491-3393). The Task Force concluded that it was important to associate with an existing commercial network as the costs of establishing a private network might be prohibitive. Existing utilities have already made extensive investments in computing hardware and software, and the personnel required to manage the network.

We investigated two other commercial networks--The Source and CompuServe--and concluded that the Delphi system contains a more "friendly" system for users, and is more economical for our needs. Delphi uses a VAX11 virtual memory super-minicomputer with high-speed disk drives and the KMS11 X.25 intelligent network processor as a gateway to other networks such as DIALOG and DIALCOM. This permits, for example, accsess to the ERIC data base. Delphi also uses the VAX/VMS operating system with DECNET, PSI, DATARETRIEVE, and various language compilers. More concretely for us, however, is that the SCA can use Delphi for (1) information retrieval; (2) teleconferencing; (3) electronic mail including, but not exclusively, E-COM; (4) telemarketing; (5) polling; and (6) travel services. While there are many other services available through Delphi, we believe these are the more significant ones of interest to us.

Proposed SCA Databases

A Bibliographic Index which would contain the 16,000+ entires currently published in Matlon's Index to Journals in Communication Studies. This data base can be updated

every three months, and can be searched by anyone by journal, data, author, title and subject descriptor.

Announcements, news and notes, education/research notes and development, ERIC reports, and classified positions--any information currently published through SPECTRA.

Placement Services, including job openings and credentials.

Speech Communication Director, including names, addresses, and telephone numbers of members--a kind of national SCA telephone and address book.

Cost Factors

Cost factors for use of Delphi are in two parts: (1) Those costs for individual members who would be part of the network; and (2) those costs to SCA.

Individual costs would include the purchase of a personal computer and modem, and the connect time costs of $6.00 per hour between 6 p.m. and 8 a.m. local time, and anytime Saturdays and Sundays. Prime connect time costs are $16.00 per hour between 8 a.m. and 6 p.m., Monday through Friday. Tymnet is available through local telephone numbers in all but remote local areas of the country.

SCA costs would include storage of information for data bases, preparation of any peculiar software which the SCA might require, and the initial entry and maintenance of data bases. We assume that we need 10 megabytes of storage for our purposes.

Delphi has indicated that the following special costs would be required if the Speech Communication Association wishes to have a data base which would include the proposed data bases listed above:

1. Start-up costs, which would include writing of special software for SCA data bases would be $10,000.00.

2. Each SCA member would pay a one-time $25.00 life-time Delphi connect fee, which would include passwords and other start-up information. This normally costs $49.95. Of this $25.00, $5.00 would be credited to the SCA for its use of computer time in Annandale, Virginia. If 2,000 SCA members select Delphi, the credit earned by SCA would be $10,000.00 If the SCA should choose to increase each member's sign-up fee to $30.00, the credit earned by SCA would be $20,000.00. The funds would help defray the start-up costs, or could be used to pay for time required to enter data bases from the SCA office. For Delphi, they are willing to hold the SCA credit or issue a check to the SCA for new memberships. Delphi would bill each SCA member individually via a major credit card; institutions would be billed directly. Thus, the SCA would not be required to handle the accounting.

3. Tymnet will provide the local telephone hookups. This service permits a local phone connection in more than 600 cities around the country, reaching about 80% of the U.S. population. Canadian members can reach Delphi through DATAPAC. In addition, SCA members anywhere in the world can reach the data bases, but must make arrangements through their country's ministry of communication.

4. A 50% reduction in hook-up time costs would be available to the SCA for entering or obtaining information from the data base. Assuming costs during the regular work day, the SCA would be charged $8.00 per hour rather than the normal charge of $16.00. Delphi will provide the software necessary so that the SCA's national office (or anyone so designated anywhere in the country) will be able to prepare data entries off-line, and "up load" or "down load" any information from the data bases required. There is no premium for 1200 over 300 baud for either the SCA or any of its members. Using the higher baud rate would greatly reduce connect-time costs.

5. The SCA may need to purchase a 1200-baud modem (1200 baud is preferable to 300 baud because it will transmit data about four times faster and use less connect time), and the communications software to permit the computer's use on a network.

6. The SCA would not be charged for an estimated 10-million bytes of information required to store on disk the Bibliographic Index, information currently presented in SPECTRA, the SCA Director, and the Placement Service. This is not a trivial issue since it is common for information utilities to charge several thousand dollars for disk space. If an individual Delphi member required 10,000,000 bytes of disk storage at Delphi's regular rates, it would cost $498.75 per month, or $5,785.00 per year. Delphi has agreed not to charge the SCA for this storage requirement.

7. All other network facilities available through Delphi may be accessed by the membership, including DIALCOM and DIALOG which contain additional encyclopedic and library information.

8. A manual would be available for each individual member at $19.95, which is intended to provide enhanced information for each user. However, this is optional. The SCA may wish to write its on 5- to 10-page manual.

9. Delphi also would provide E-COM services, mail, and teleconferencing for any group or groups within SCA.

10. The SCA would be permitted to charge a royalty if it so desires for use of these services by SCA members, or any non-SCA members. The SCA would not be required to handle the accounting for charges made by individual members. This would be handled directly by Delphi, who would bill the individual members for connect-time usage.

We compared the services and costs of Delphi with two other commercial systems, CompuServe and The Source. Individual memberships for CompuServe are $89.95 retail, with the SCA able to make about $10.00 per individual membership if it (SCA) sells direct. Each individual would also pay $12.50 per hour of connect time weekdays, 8 a.m. to 6 p.m. using 300 baud rate; $15.00 for 1200 baud. Connect time weekdays from 6 p.m. to 8 a.m., Saturdays, Sundays and holidays would be $6.00 for 300 baud and $12.50 for 1200 baud. There is a 35% discount on individual memberships if the special interest group has at least 1500 members.

Costs to the SCA for CompuServe would be as follows:

$2,500 for the first 90 days, which would include:

- Installation
- Training of one administrator (each additional administrator would be $500.00)
- Announcement capability
- 250 messages
- On-line conference capacity
- Member interest file
- 704K disk storage

$1,000 per month for all of the above after the first 90 days. Additional charges raising disk storage capacity to 10 megabytes would be $4,357.50 per month.

In summary, CompuServe's costs would run $52,290.00 per year. If more than 250 messages are required for any single month, an additional charge would be required.

The Source charges $100.00 individual start-up fees, and similar per hour charges to CompuServe. I did not gather any information on their private forum pricing, assuming that they were similar to CompuServe.

Some other considerations are that CompuServe and The Source would structure our data base needs according to their existing software, whereas Delphi would tailor the software to our particular interests. This is quite important, since limitations of categories for data search in CompuServe's software might be too simple for SCAs needs. In addition, the SCA might, at some future time, prefer to operate its own information utility. The SCA would retain proprietary interests in any specialized programs and data bases prepared by Delphi.

Conclusions

There are a number of conclusions which can be made regarding the networking of the Speech Communication community. Clearly, it must be said that some work is better done individually on equipment personally selected. And we have argued that Local and Expanded Area Networks

should be encouraged, but they should not be the responsibility of the Speech Communication Association.

National Area Networks are the business of the Speech Communication Association, dealing with the political, social and functional needs for the maintenance of our professional and scholarly identity. I do believe there are a number of implications for the identify of our discipline should we do this. For example, the very act of democratizing our knowledge will make our scholarly work more competitive, and at the same time may standardize our ontological base. Much can be said about this, but it is enough for now to say there are a large number of implications of networks as they impact on our discipline. We cannot opt out of the information revolution to maintain our identity. We can, however, make a concerted effort to ensure that we use the information technologies as a benefit, minimizing those disadvantages which most surely will evolve.

The SCA should move now to form a network, establish data bases appropriate to our national needs and interests, and to do this with Delphi. The data bases should include the index to our journals, Spectra, Placement Services, and the SCA directory. We should also make it possible for electronic mail and conferencing, and we should begin preparation for the movement of manuscripts. There are a number of technical and workability problems associated with the movement of manuscripts. For example, the very differences which exist in the operating systems of microcomputers makes it difficult to pass manuscripts from one piece of equipment to another. And it is not realistic, such as that proposed by Science Press, to train every contributor of manuscripts in the editing markers required for manufacturing. There are technical alternatives, among them procedures used by Graphic Typesetting Service of Los Angeles, California. And we have not yet addressed the technical problems associated with the movement of graphics. It is my opinion that we are not yet technically ready to move manuscripts in ways we have described above. Or perhaps more accurately, the technology exists; the technology is not yet in place, however, to achieve the kind of widespread use we envision here.

If, for some reason, the SCA should not be willing to establish a network now, we would propose--with some

reservations--that an informal network be established. There at least would be available the advantages of electronic mail and teleconferencing which can proceed immediately. If we do take this action, we recommend that it be done with Delphi in the hope that at some future date, SCA will see its way clear to make the kind of "leap of faith" required to establish a network. A problem in establishing an informal network, however, is that the more who join now, a potential financial resource for SCA to recover its investment is jeopardized through the changes in the financing structure described earlier in this paper.

The SCA should encourage, but not be responsible for, the establishment of Local and Expanded Area Networks as we play a full role in the information revolution. We can, for example, use the national network as a clearing house for evaluating software; we can also continue to report these evaluations in our journals, such as Communication Education. And we can encourage over the short term the use of resources at the local and expanded area levels through the publication of articles in our journals. I would envision, however, the need for an annual or semi-annual publication devoted to just this topic. We should give serious consideration to this. It may indeed be something for a particularly resource-rich university of college to take on as a service to the discipline.

Establishment of a national network could and should be self-supporting, including establishment of the data bases and participation by its membership. Realism suggests, however, that not all will adopt the innovations we have described. If 2,000 of our members (35%) are willing to support a National Area Network, we could begin now. Those who do not participate should not be disenfranchised by being unable to get the existing printed materials such as the Bibliographic Index, Spectra, and the SCA Directory. We should not look for the NAN to be a cost-saving device as we know there will always be those who will not wish to be part of the technological revolution for any number of reasons. The literature on diffusion should make this abundantly clear. At the same time, we believe it is important to devote some of our resources to carry out this project. It calls for some far-sightedness on the part of our association's leaders, and some courage. It may be quite useful for us to seek grant assistance in the establishment of

such a network, including the support of a full-time office associated with the SCA to carry out the project. Such a dedication of resources would be of limited duration (say, 3 to 5 years), with the understanding that the national office of SCA would ultimately take over the responsibility of maintaining and developing the national network. At least, we view this as a valid possibility, and one which would hasten our movement into the future information age.

Finally, we should explore cooperation with other communication organizations in the sharing of resources in order to make this a broad-based and powerful system. These might include the traditionally "affiliated" organizations, such as the American Speech and Hearing Association, International Communication Association, American Forensics Association, American Parliamentary Practice, Association for Communication Administration, Cross Examination Debate Association, International Society for the History of Rhetoric, National Forensic Association, American Association of Phonetic Sciences, American Business Communication, Canadian Speech Communicators Association, International Listening Association and many others.

At times, all of us are alternately elated and depressed over the likelihood of our scholarly community participating in this new information age. At our highest times, we make many grand and marvelous predictions about what can and will be as a result of the new computing technology. At other times, we withdraw into our cocoons as we flee from the potential social consequences of the new times. We know what can be; we are unsure of our individual and corporate ability to wrest ourselves from our past ways of doing things and embrace the future. Dizard (1982) makes it quite clear:

> The stumbling blocks to realizing this potential lie not in those who exaggerate the computer's capability, but in those who fear it. There is a disturbing tendency to retreat from the implications of the new machines, to deny the possibility of a viable technology-powered democratic society. These anti-technology forces... seek solace in astrology...and bad poetry (p. 15).

It is the hope of this Task Force that we shall take the opportunities we now have and stake our future on the very substance of our discipline--the management of human communication.

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Chapter 2

Information Utilities for SCA Members

Frederick Williams

As if the entry of millions of personal computers into our lives in the last decade were not enough, we are about to witness a new phase in the uses of these machines. In the next few years, we may see personal computers used more for communication than they are now used for calculation or even word processing. Already it is possible for the average person, without any technical knowledge or overly expensive equipment, to "call up" everything from a bank balance to the latest AP news. Of particular value to SCA members are such services as bibliographic databases, electronic mail, access to newspaper and newsletter files, financial databases, and travel schedules. The variety of services is growing daily.

Many of these services are so new that most people are unaware of them. Or they may assume that using a computer to get them is too complicated or expensive. The facts are that:

> Personal computer communications is hardly more complicated than making an ordinary telephone call. You need know nothing about programming to use it.
>
> It is not necessarily expensive. You can "talk" with another computer user or dial into "bulletin boards" for the price of a phone call. A subscription to any of the major information "utilities" is not expensive, given what they provide you (and they are sometimes free with computer equipment or software). You can use such a service regularly and not have a monthly bill of over $25. Telephone charges are not excessive either. In most cases, you can make your calls to the information services via a local number that ties into a special computer network, and the cost is often less than $2 an hour.

You do not need highly complex or expensive equipment. Almost any personal computer can be made to communicate. You will need a piece of equipment (called a "modem") that allows your computer to communicate via your telephone. Although many computers require loading a special program to allow them to communicate, these need not be overly expensive.

It is easy to locate multipurpose information services. You can buy subscriptions from most computer stores for such popular companies as CompuServe, The Source, Dow Jones News/Retrieval, or for several other services. Most of these companies offer a toll-free number for start-up information.

Perhaps the most important fact about this newest revolution is that computer communications offer a growing variety of personal and professional benefits that you can put to work immediately. Indeed, the opportunities have been growing faster than most people's ability to learn about them. You need only have a look at this new world of information and services to discover practical applications for your personal and professional needs.

In this chapter, we will describe two major types of services. One type is the "information utility," where a wide variety of services is available via one subscription. The others are more specialized where you contract for a specific service as, for example, bibliographic data.

The Major Information Utilities

The widest range of publicly available computer communications services come from subscriptions to one or more of the popular "information utilities." These are services like The Source, CompuServe, Dow Jones News/Retrieval, or Delphi. An initial fee typically gives you "log on" instructions (phone numbers, procedures), an identification code, a secret password, and documentation on how to use the service. You are then charged an hourly rate for being on-line, small additional charges for linkage via a telephone network, and special surcharges for some

services. Most companies prefer to bill you via one of the major credit cards, although it is possible in some cases to be billed directly.

Before moving to a few details on these popularly available services, here are some thoughts to keep in mind.

1. Low-cost, non-prime-time services: The information utilities offer low-cost access if you use them during evening and nighttime hours, weekends, or holidays.

2. Low-risk investment: Some services will give you a month's free trial or offer a money-back guarantee. And, as we said earlier, many are offered in free introductory packages. Your advantage is that it is very easy to "try-out a service with a minimum investment of your time and money.

3. Customer assistance: The services all have "help-line" numbers you can call for assistance with anything from changing your password to getting a new computer on-line. As with so many "800" hot lines, you may have to wait to get your call through, but it's usually worth it.

Finally, if you just want to try personal computer communications before you investigate any subscriptions, get on-line with a friend, call a public bulletin board or find a computer store that will give you a demonstration.

The Source

Source Telecomputing Corporation
1616 Anderson Road
McLean, Virginia 22110
(Telephone: 703/734-7500)

The Source is a subsidiary of the Reader's Digest Association, Inc. This service is owned by professionals who also publish the world's largest circulation magazine. "Electronic publishing" is serious business, and its owners have invested millions in the attempt to create an attractive and easily used service.

When you subscribe to The Source, you receive a well-edited and organized handbook. Its contents are divided into 11 practical sections, including introductory materials on how to get started, followed by separate sections on communications, news, business, consumer, entertainment, publishing, travel, education and computing services. The handbook is sufficiently illustrative that if you borrowed one from a Source subscriber, you could gain a very clear idea of what the service has to offer. There is also a Command Guide pamphlet that summarizes the major commands and options of the service.

If you skim through the following record of a log on sequence with The Source, you gain a first-hand feel for the service. The "->" or "?>" signs are the prompts where you respond with your information or commands. We have added the comments in brackets ("[...]") for explanatory purposes; they are not a part of the service.

You dial into The Source via one of the special telephone networks that allows you to use a local number (unless you are in a small town or in a rural area). The first thing that shows up on your screen is your entrance into a computer telephone network, in this example, Telenet.

TELENET [you're on Telenet]
213 5A

TERMINAL= d1 [you put in that your terminal is "d1"]

@c 301159 [you enter the code that accesses The Source]

301 159 CONNECTED [you're in!]

Connected to THE SOURCE

> ID AAA000 111 [you enter your id number and password]

AAA000 (user 16) logged in Tuesday, 21 Oct 84 07:31:04.

Welcome, you are connected to THE SOURCE.

Last login Monday, 20 Oct 84 00:01:12.

(C) COPYRIGHT SOURCE TELECOMPUTING CORPORATION 1984.

WELCOME TO THE SOURCE [here are your options]

1 USING THE SOURCE 2 TODAY
3 BUSINESS UPDATE
4 THE SOURCE MAIN MENU
5 WHAT'S NEW
6 COMMAND LEVEL

Enter item number or HELP 4 [we ask for the main menu]

THE SOURCE MAIN MENU

1 NEWS AND REFERENCE RESOURCES 2 BUSINESS/FINANCIA MARKETS
3 CATALOGUE SHOPPING
4 HOME AND LEISURE
5 EDUCATION AND CAREER
6 MAIL AND COMMUNICATIONS
7 CREATING AND COMPUTING
8 SOURCE*PLUS

Enter item number or HELP

You can then work your way to menus, or if you know the codes for the individual services you can enter them directly just as soon as you "quit" the menu mode by typing "Q." This gives you the prompt ("->") which you can then respond to with a request. When your session is over, "OFF" gets you disconnected.

CompuServe

Consumer Information Services
5000 Arlingtcn Centre Boulevard
Post Office Box 20212
Columbus, Ohio 43220
(telephone 800/848-8990)

Like The Source, CompuServe is owned by a well-known corporation. In this case, it is H & R Block, Inc., which originally started the service in 1972 to offer opportunities for nighttime data processing. Today, they have added a great variety of news, information, and entertainment services.

When you subscribe to CompuServe, you receive a modest amount of literature telling you how to use the service (sometimes that literature is in a starter kit form that you buy). If you wish, you can then order more detailed guide books or separate directions for more complex games and the like. Also, you can request these directions while on line, print them yourself or copy them onto a disk.

Your subscription also includes CompuServe's Online Today magazine and a newsletter called Update. Several times each year, Online Today includes a booklet listing all of CompuServe's individual services and the commands for them. You can also call for this listing when online and copy it into your computer or make a print-out. Or you can search it online.

Some reviewers have characterized CompuServe as being a bit more hobbyist oriented and slightly more complicated to use than The Source. Frankly, the difference is not all that great; perhaps some of that initial impression is due to the more comprehensive instruction book provided by The Source. But now, CompuServe's newer "Executive Information Service" has an excellent manual.

CompuServe has many of the same or similar major features as The Source including, for example, mail, conferencing, bulletin boards, direct communications, news, business items, groups, programs, programming, educational information and shopping. It has a few more alternatives, as well as more specialized services; for example, an information service for private aviators.

Also like The Source, you can find what you want within CompuServe either by working your way through a series of menus, or by using a direct command to go to the particular service. (If you are looking for esoteric services, you can probably find them faster in CompuServe because, as mentioned above, you can actively search its index.)

Here is a log on sequence for CompuServe's Executive Information Service. The prompt which requests input from you is the "!".

Executive Information Service
21:29 PST Monday 08-OCT-84

CompuServe Page EIS-1

EXECUTIVE INFORMATION SERVICE

1 Communications
2 Investments & Quotes
3 Decision Support
4 News
5 Travel
6 Shopping
7 Weather
8 Professional & Technical
9 Consumer Information Services
10 User Information

Enter your selection number, or H for more information.

As a member of the executive Information Service, you can also request entry into the regular ("CIS") service. You can do this from the above menu (option#9) or at a command level by entering: GO CIS.

Dow Jones News/Retrieval

Dow Jones & Company, Inc.
Post Office Box 300
Princeton, New Jersey 08540
(telephone 800/257-5114 or
609/452-1511 in New Jersey)

As you can readily guess, Dow Jones News/Retrieval is operated by the publishers of the Wall Street Journal and Barrons, the long-time providers of market information.

Although its main offerings are business information, including files from its publications, the service has been adding other items of interest. For example, you can send MCI mail, check general news headlines, consult the Official Airline Guides, use Comp-U-Store, access the Academic American Encyclopedia, and get sports news or even movie reviews.

In broadest terms, Dow Jones business services include both current and historical records of "quotes" (e.g., stocks, bonds, etc.), financial and investment services (e.g., corporate information), and business and economic news. The latter service incorporates material from Dow Jones publications, including headlines and summaries from the current Wall Street Journal. (Yes, you can now access highlights from the Journal online.)

One of the most powerful features offered by Dow Jones News/Retrieval is their "text search." By using any combination of words, dates or numbers, you can search through the Dow Jones files for anything published since June, 1979. Search services are invaluable for locating items embedded within stories which may have escaped the overall indexing process.

With your subscription, you receive a 200-page manual that describes the basic commands for the service, but contains mostly code designations for gaining information on specific stocks. You receive occasional follow-up mailings, including supplements to the manual.

The Dow Jones online services are generally easy to use but if you are going to use them for market information, you will need to know what types of information you seek. Here is a typical log on sequence for Dow Jones News/Retrieval (via Tymnet):

Please type your terminal identifier [usually an "A" for Tymnet]

-3406-000-
please log in:

user name: DOWL; [you ask to link to Dow Jones; it's the "user"]

host is online

WHAT SERVICE PLEASE????
DJNS [this is the particular service within Dow Jones]

ENTER PASSWORD
WWWWWWWWWWWWWW [these disguise your password]

DOW JONES NEWS/RETRIEVAL [you're on!]
COPYRIGHT (C) 1984
DOW JONES & COMPANY, INC.
ALL RIGHTS RESERVED.

FREE TIME OFFERED IN NEWLY [special notes about updates]
UPDATED //ENCYC, SEE //INTRO
FOR DETAILS. SEE //MENU
FOR A DATA-BASE LIST.

ENTER QUERY [this is for your prompt to enter a request]
//MENU [you ask for the main menu]
Master Menu
Copyright (C) 1984
Dow Jones & Company, Inc.

PRESS	FOR	[here are your options]
A	Dow Jones Business And Economic News	
B	Dow Jones Quotes	
C	Financial And Investment Services	
D	General News And Information Services	
E	Mail Service and Free Customer Newsletter	

* * *

For an overview, type //DJ HELP

Dow Jones News/Retrieval is divided into major data bases (files), each of which you initially access by a label preceded by a double slash--for example, //DJNEWS (Dow Jones News), //WSJ (The Wall Street Journal), or //SPORTS (News/Retrieval Sports Report). The great strength of this service is to get current or background information on

specific stocks, bonds and mutual funds, each of which has a specific access code. Another service is the ability to search files (back to 1979) of The Wall Street Journal, Barrons, or the Dow Jones News Service, using any key words that might appear in an entry. This is called a "free text" search, and it is a powerful research tool.

Delphi

General Videotex Corporation
3 Blackstone Street
Cambridge, Massachusetts 02139
(telephone 617/491-3393)

Delphi is a newer and smaller online information service than those just described. However, it is very well designed, and so easy to use that you notice this quality. You can see its main offerings on the menu shown below in the sample log on. It also offers access ("gateway") to other services such as Official Airlines Guides, the Academic American Encyclopedia, or specialized information services like "Dialog."

Here's a sample log on to Delphi (via Tymnet):

---

please type your terminal identifier [usually an "A"]

-2572-040 [you are in the network]

please log in: DELPHI

remote: call connected

Username: FWILLIAMS
Password: [password goes in but does not show on screen]

Logon at: 29-OCT-84 21:50:15

Hello FWILLIAMS

Welcome to DELPHI V2.0

Copyright (c) 1984

General Videotex Corporation

MAIN Menu:

BULLETIN-BOARDS
CONFERENCE
DELPHI-ORACLE
EXIT
FINANCIAL-SERVICES
GAMES
GUIDED TOUR
HELP
INFOMANIA
LIBRARY MAIL
NEWS
ONLINE-MARKETS
PROFILE
SCHEDULER
TRAVEL
WRITERS-CONRER

MAIN>What do you want to do?

One of the special features of Delphi is the "Guided Tour" (on the above menu). If you are new to the service, this option gives you an efficient and interesting briefing on how the service operates. It is handy if you haven't been online for a while. Although Delphi furnishes you with menus of options, you move to different services by direct commands following a prompt sigh that tells you where you currently are--e.g., "MAIN>" above. If you wish to know your options, you need only type: "HELP."

Selected Special Services

BRS/After Dark

In the last few years, if you wanted to research large bibliographies in the social sciences, education, economics or

medicine, you had to go to a major library and often consult a reference librarian. Now, many of those specialized reference services are becoming available via your personal computer, and for prices that are within reach. One major example of this is "BRS/After Dark." The initials stand for "Bibliographic Retrieval Service," and "AFter Dark" to the fact that it offers low-cost access to bibliographies during non-prime-time hours, namely nights and weekends.

BRS/After Dark
1200 Route 7
Latham, New York 12100
(telephone: 800/833-4707,
800/553-5566 in New York state,
518/783-7251 from Alaska, Hawaii and outside the U.S.)

Official Airlines Guides--Electronic Edition

In a nutshell, the online Guide will give you the latest information on airline schedules and fares. But you cannot book a reservation via this service, although this capability is likely to be possible one of these days. Like its printed counterpart, the Official Airline Guide is invaluable for trip planning. It not only saves you time with your travel agent, but will show you alternatives that either your agent might overlook or a competing airline might not be inclined to find for you.

Official Airline Guides--Electronic Edition
200 Clearwater Drive
Oak Brook, Illinois 60521
(telephone 312/654-6000)

MCI Mail

MCI Mail gives you the option of a computer-to-computer service if the addressee is a user of the service. Otherwise, after you create your letter, you have postal mail or courier options for its delivery. These and their current rates include: forwarding via U.S. mail ($2), courier delivery by noon the next day ($6), or hand delivered in major cities within four hours ($25). These rates apply for up to 7500 text characters (about 4 pages),

with a $1 fee for each additional group of 7500 regardless of the delivery option.

Currently, you can obtain access to MCI Mail services by enrolling via Dow Jones News/Retrieval or directly to MCI at this address or phone:

MCI Mail
2000 "M" Street, Northwest
Washington, D.C. 20036
(telephone 202/293-4255)

NewsNet

Just about every specialized area of business is served by a professional newsletter, sometimes many of them. These newsletters are often very expensive and are not easily found in traditional libraries. NewsNet is a service that currently offers access to over 175 business newsletters, in addition to United Press International and a special Public Relations newswire. You pay an hourly rate for NewsNet, plus special surcharges that vary by newsletter. The address of NewsNet is:

NewsNet
945 Haverford Road
Bryn, Mawr, Pennsylvania 19010
(telephone 215/527-8030)

***

Chapter 3

Computers in Speech Communication: A Survey--1984

Leanne O. Wolff

James Golden (1982) described this as "The Age of Communication." While computers appear to be as pervasive as conflict in the human environment, it is the apparent low level of computer utilization in the speech communication discipline which is noteworthy. Surveys of communication literature and searches in the commercial catalogues for communication-related materials have not been productive.

Park's (1972) survey of the literature relevant to computers in speech communication revealed that most applications were those of research, not instruction. Park reported an interest in finding computer uses for the classroom, but almost all of the references cited were from outside the field of communication. Several games and simulations commonly used in communication which could be computerized were identified.

Wolff (1981) conducted an ERIC search for CAI (Computer Assisted Instruction), locating only Park's article and another cited by Park. She found no CAI program specifically designed for speech communication available from Edunet or Conduit. The INDEX TO JOURNALS IN SPEECH COMMUNICATION listed five entries under computer instruction, but these dealt only peripherally with the topic. Wolff concluded that while most school children have daily access to computers, speech communication professionals were either not utilizing the computer as an educational tool or not publicizing and sharing their software. She also found that other disciplines have been developing and making available a wide variety of software, including tutorials, simulations and problem-solving packages.

By 1982, a few persons had begun an informal network to share ideas and programs. At the 1982 SCA convention in Louisville, a Short Course on Computers in the Classroom

was first presented by Ashmore and Wolff, and several papers were presented (4).

Later that year, President Frank X. E. Dance appointed the Computer Task Force, which met in Washington in 1983, to continue the study of computers in the SCA. The Task Force concluded that the first step toward having more materials available for the speech communication professional was an analysis of present computer utilization by SCA members.

PROCEDURE

At the 1983 Speech Communication meeting, the SCA Computer Task Force authorized a survey of SCA members. This survey, which was focused primarily on those members in education, had several major objectives: (1) to locate members who use the computer in their work; (2) to determine the extent of computer usage; (3) to identify the tasks for which SCA members are using the computer; and (4) to ascertain the types of computer resources SCA members would like to have available in the future.

A 21-item survey was distributed to the 5200 members along with the April, 1984, issue of SPECTRA. Responses were received from 501 SCA members.

RESULTS

Accessibility of Computers

Three-hundred ninety-four, or 78.6%, of the respondents reported they have access to a computer for their work. Of these, 256 (51.1%) own their personal computer while 109 (21.8%) reported plans to purchase their own (a few persons indicated plans to upgrade their present system).

Among the 501 respondents, 56% have access to computers through the university computer center, 16% through school computers (mostly elementary and second-

ary), while 36.9% report access to computers owned by their departments.

TABLE 1

SCA Members Access to Computers

	Yes	Percentage	No	Percentage
Own a Computer	256	51.1	245	48.9
Plan to Buy	109	21.8	392	78.2
Have Access Now	394	78.6	107	21.4
Have Access to University Computer	285	56.9	216	43.1
Have Access to School Computer	81	17.2	420	83.8
Have Access to Department Computer	185	36.9	316	63.1

Access to their institution's computer appears to be a function of size of the institution with respondents from four-year colleges having the greatest opportunity to use the college computers. At the university level, members in the small universities (under 5,000) and in those with enrollments over 15,000 report greater access than do those in the mid-size university.

TABLE 2

Access to University Computer

Institution Size	Access	No Access	Percentage With Access
Community College	12	6	67
Four-Year College	34	3	92
University Under 5000	59	15	80
University 5000-15000	108	32	77
University Over 15000	120	23	82
High School	17	3	85
Non-Academic	12	10	56
Not Specified	32	15	68

It is the mid-sized university instructor who reports more opportunity to use departmental computers. The number using departmental computers are, however, small and differences among the institutions by size are insignificant.

TABLE 3

Access to Departmantal Computers

Institution Size	Access	No Access	Percentage With Access
Community College	6	12	33
Four-Year College	13	24	35
University Under 5,000	24	50	32
University 5000-150000	64	78	46
University Over 150000	58	85	41
High School	3	17	15
Non-Academic	3	19	14
Not Specified	14	33	30

The availability of computers in departments is unclear. As noted above, 185 respondents (36.9%) reported access to departmental computers, but 251 (50.1%) of the respondents indicated that all faculty members had access to departmental computers while 112 (22.4%) indicated access for chairpersons.

Student usage of departmental computers is, however, limited. One-hundred twenty-three (24.6%) report graduate student access, while only 69 (13.8%) acknowledge that undergraduates may use departmental computers.

Others who utilize departmental systems include administrators and secretaries (37), selected students (8), debaters (2), researchers, technicians, theatre box office, and the public relations person.

One-hundred forty-five (28.9%) of the respondents indicated students on their campuses have no access to computers, while 26.7% reported that more than 15 computers and/or terminals are available to students on their campuses.

Where students have access, they typically use computers located in computer centers (64%). A small number (22%) reported that students may use departmental systems. On many campuses, of course, students have access in several sites.

Computer Brands In Use

SCA members are working with many types of computers. At the university level, IBM was the most frequently named system, followed by VAX. The computers reported are summarized in Table 4.

TABLE 4

Computers Owned By University

Brand	Number Reporting
IBM	100
VAX	43
CDC	16
APPLE II	13
CYBER	12
DC	1
Other	73

IBM PC's are also the most prevalent in departments as indicated in Table 5.

TABLE 5

Departmental Computer Brand

Brand	Number Reporting
IBM PC	60
APPLE II	57
TRS 80	18
T.I.	3
MORROW	3
Other	54

While IBM and Apple personal computers predominate in departments and school systems, the brands owned by SCA members are more numerous. Seven brands account for 75% of the member-owned PCs reported although 48.9% of the respondents did not specify the brand. As indicated in Table 6, the Apple II is the most common, followed by Kaypro and IBM PC. It should be noted that when the survey was conducted, the Apple II, the Macintosh and the IBM PC Jr. had just been introduced to the market.

TABLE 6

Computer Brands Owned by SCA Members

Brand	Number Reporting
APPLE II	48
KAYPRO	35
IBM PC	31
TRS-80	25
COMMODORE	24
OSBORNE	19
T.I.	10
Other	57
More than 1	7

Computer Applications

Word processing was listed as the most common computer application with 411 (82% more than indicated having computer access!) reporting positively. Manuscript preparation was cited by 369; letter written by 332; resume processing by 232, information retrieval by 126 and other uses by 135.

TABLE 7

Word Processing

	Number Using	Percentage of Total
Some Type	411	82
Manuscripts	369	74
Letter	332	66
Resumes	232	46
Information Retrieval	126	25
Other	135	27

More than half (276) of the respondents do computer record keeping. Syllabuses were the most frequently reported records (171 or 34.1%) followed by mailing lists (154 or 30.7%). One-hundred ten reported computerizing budgetary information while 80 (16%) work with time schedules. Smaller numbers create attendance records (35, 7.0%), student critiques (38, 7.6%) and advising information (41, 8.2%).

TABLE 8

Record Keeping

	Number Using	Percentage of Total
Some Type	276	55
Syllabi	171	34
Grades	157	31
Mailing Lists	154	31
Budgets	110	22
Time Schedules	80	16
Advising Information	41	8
Student Critiques	38	8
Attendance	35	7

Almost one half of the respondents, 221 or 44.1%, are using the computer in their research.

Fewer than half of the respondents (237 or 47.3%) reported instructional applications. The most frequently indicated applications were test generating (140, 27.9%) and quizzing (109, 21.8%). The computer's mathematical capabilities are used by some for instructional data analysis (86, 17.2%) and student research (81, 16.2%). Less frequently mentioned instructional strategies included tutorials (45, 9.0%), simulations (39, 7.8%), CAI units (30, 6%), and modeling (11, 2.2%).

TABLE 9

Instructional Uses

	Number Using	Percentage of Total
Some Use	237	47
Test Generating	140	28
Quizzes	109	22
Data Analysis	86	17
Testing	81	16
Student Research	56	11
Tutorials	45	9
Simulations	39	8
Other CAI	30	6
Modeling	11	2

PROGRAM WRITING

About one-fifth of the respondents (105) have written computer programs. Twenty-four designed statistical packages, while 16 have developed their own record-keeping and grade-reporting systems, and 21 persons have created utility programs such as printer controls.

Instructional materials have been created by 32 respondents. A computerized Stress Inventory, simulation of political campaign communication, a computer version of Prisoners' Dilemma, models of communication and mass communication, and a program for student advising are among those written by SCA members. CAI topics programmed include composition, broadcastwriting, argument analysis, idea development, communication process, and figures of speech. Student and faculty evaluations and speech critiques have been computerized, as have theatre budgets and time management ideas.

Tutorial topics include research in speech outlining, mastering public speaking, debate issues, evidence and reasoning, disclosure, and conflict. Other programs reported include an extemp file, debate matching, qualitative

research, volunteer interviewing, reading mazes, and a program for teaching research design and statistical analysis concepts.

The majority of these programs are written in Basic, although some are in PL1, Pascal, Fortran, Tutor, Pilot and Superpilot.

DESIRED RESOURCES

Interest in purchasing software for instructional purposes was signified by 276 persons (55.1%), while only 49 respondents (9.8%) indicated they would develop their own materials. Giving an idea to a programmer appealed to 71 (15.2%), while 42 (8.4%) suggested that publishers would be a preferred method of software development.

Simulations (93 respondents) and CAI materials (65 respondents) were the most desired types of software. Testbanks, research tools, data bases, tutorials, games, assessment devices, and test-generating software were also listed.

The content of desirable software covered almost all topics covered in the range of communication classes. Included in the respondents' "wish list" were newswriting basics, speech organization patterns, conflict, persuasion, outlining, audience analysis, broadcasting, critical thinking, graphic stage design, argumentation, invention, forensic procedure, organizational communication, and intercultural and group simulations for research models.

DISCUSSION

Five-hundred one persons responded to the survey on computer use, providing the most complete information on SCA members' computer utilization to date. Several persons commented on the education bias of the survey, pointing out that many SCA members are not in education. The two-page format and imprecise wording limited both the amount of information and the usefulness of the responses to some

questions. From the data detailed above, however, several conclusions can be drawn.

More than three-fourths of the respondents have access to and one-half own computers, but no generalization can be made concerning the kinds of computers used by the respondents. Although IBM and APPLE predominate, computer brands used by SCA members are probably as varied as those in any other segment of education. But there are no networks, no user groups and often no software for the SCA computer user, an isolated pioneer.

With the limited number of returns precluding precise generalizations, the survey does reveal that a high percentage of SCA members, like other members of society, are using computers for a variety of purposes. Word processing, including manuscript preparation and letter writing, is utilized by as many as have access to a computer. More than half are keeping computer records, while almost one-half of the membership may be using the computer in association with their research. Software is widely available for these activities, and the respondents reported using may programs. Although both names and evaluations of software were requested in the survey, the results could not be tabulated. Cursory examination, however, indicates a diversity of commercially available software is in use.

The survey confirms the dearth of materials for computer-assisted instruction (CAI). While almost one-half of the respondents report instructional uses, most of these involve test-generating and quizzing. Even though 20% of the instructors use number-crunching capabilities for data analysis and student research, other applications are extremely uncommon. Few respondents reported using a CAI program other than those personally programmed and none indicated any commercially available software. A wide variety of CAI types and topics have been used by the 32 respondents who have programmed instructional materials; unfortunately, the programmer is apparently the only person using each piece of software. In addition, it is highly probable that educational software exists, created by other SCA members who did not respond to the survey. That material remains unavailable to potential users. It should be noted that over one-half of the respondents indicated a

desire to use CAI materials, preferably those developed by someone else.

If the discipline is to move the Age of Communication nto the speech communication classroom, the challenges are evident. Persons who are developing CAI materials need to be encouraged. Evaluation and distribution of software must be promoted and facilitated. Repositories such as Edunet and Conduit should be utilized or others created so that materials could be available to all at a reasonable cost, and with protection and remuneration for the creators.

A newsletter or some form of networking for those interested in CAI is essential. Persons need to know what others are doing, both for inspiration and to avoid several persons inventing the same wheel.

The possibility of communication organizations commissioning the development of software should be investigated. In the past, SCA has commissioned books on criticism and history which have been widely used as educational tools. Similarly, simulations and tutorials could be commissioned and distributed by SCA.

The SET-UPS programs of the American Political Science Association should be emulated. Consisting of a data base and booklet on research developed by professionals, SET-UPS teach undergraduates hypothesis testing and data analysis. The many excellent researchers in communication surely have data which could be similarly employed. Like the American Political Science Association, SCA should commission a series of these units for use in our undergraduate programs.

Unlike many other disciplines in the Humanities and Social Sciences, communication has not yet adopted the computer as an important educational tool. The survey indicates many are interested, but much organization and encouragement will need to be forthcoming if the computer is to emerge as a viable teaching device in speech communication.

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Chapter 4

Evaluating CAI Material for the Microcomputer

Timothy M. Ashmore

The relative worth of any evaluation instrument is always a product of the needs of the user and the material being evaluated. As obvious as the statement may appear, the generation of a quality instrument is complicated when there are a variety of potential users with differing needs who wish to apply the instrument to a wide variety of materials. This is precisely the case facing the author of an instrument with which to evaluate Computer Assisted Instructional (CAI) material.

This chapter describes the potential users of such an instrument, the functions of the instrument, and the content of the instrument. The paper will then review a number of published evaluation forms and conclude with a presentation of a new form which reflects the strengths of the reviewed forms.

The potential users of a 'good' evaluation instrument include purchasers, authors, reviewers, and publishers of CAI materials. Each class of user has their unique set of needs that must be met by the evaluation instrument. However, a 'good' instrument will serve two general functions for all users. The general functions are education and discrimination.

Specifically, the evaluation instrument should educate the purchaser of CAI materials as to the variables that are important in the evaluative process. The aspiring author of CAI software and the accomplished programmer alike should learn from the instrument what characteristics are valued in CAI materials. The reviewer of CAI software should also be able to benefit from an evaluation instrument that requires a thorough examination of a wide variety of potentially significant variables. In the same light, a Communication Editor or Field Representative should be able to utilize an

evaluative instrument to ascertain the nature and quality of potential CAI materials.

The evaluation instrument serves a discriminative function when it allows the purchaser of CAI materials to critically evaluate or compare any number of similar pieces of software. Such a comparison or evaluation should save the purchaser a substantial amount of time and money. The instrument also serves a discriminative function for the CAI author when the instrument is used as the basis for developing and field testing the author's product. Therefore, the author is better able to objectively ascertain the relative educational value of her/his program by checking the program against a predetermined set of criteria contained in the evaluation instrument.

Assuming the above user needs and instrument functions are correct, it is then appropriate to discuss the content of a 'good' evaluation instrument. The content typically addresses such issues as the biographical/ bibliographic data, content data, documentation, and special characteristics of the program. The biographical/ bibliographical data contains such information as:

1. The name, address, and telephone number of the supplier.

2. The cost of the CAI package.

3. The program name and subject addressed in the material.

4. The appropriate grade level of the material.

5. The brand(s) and model(s) of computer needed to run the program.

6. The special memory, screen, and printer requirements necessary.

7. The program type or format (i.e., simulation, game, or drill and practice).

The content data normally addresses such concerns as:

1. The accuracy and recency of the content.

2. The program's ability to serve as a teaching aid.

3. The program's ability to motivate and hold the attention and interest of the intended student.

The program documentation requirements normally address such issues as:

1. The clarity of the program's purpose, intent, and topics.

2. Has the program been adequately validated/tested in the classroom for which it was intended.

3. The name of the subject matter and grade level(s) for which the program was intended.

4. The prerequisite skills and knowledge necessary to meaningfully utilize the program.

5. The related textual and media materials available to augment the program.

6. The clarity of the directions for the use of the program. This applies to both the printed manual and the directions as they appear on the screen.

The category of special characteristics addresses such issues as:

1. The capacity for and nature of record keeping.

2. The program's use of graphics, animation, and sound.

3. The amount of time required for the student to complete each lesson.

4. The overall difficulty of the lesson.

5. The general quality and style of writing including grammar, spelling, and carefulness of editing of the manual and the screen directions.

6. The number of students who may use the program at one time (i.e., one vs. the computer, pairs, or class demonstration).

7. The reviewer's final recommendation regarding the use, purchase, further development or refinement of the program.

The table which follows is the result of applying the criteria listed above to a number of published evaluation forms. The forms summarized here are the Review Rating Form developed for Conduit (1981); the Software Evaluation Checklist developed by the National Council of Teachers of Mathematics (1981); the Microcomputer Instructional Software Evaluation Form developed by the Pennsylvania State Department of Education (ED 205 201); the Courseware Evaluation Form developed by the Northwest Regional Educational Laboratory (198); the CAI Courseware Review Checklist developed by Robert L. Burke in CAI; Sourcebook (1982); the Microcomputer Courseware Evaluation Form by the EPIE Institute (1982); the School Microware Evaluation Form developed by Dresden Associates (1982); the Microcomputer Educational Materials Evaluation Form developed by the Minnesota Educational Computing Consortium (1982); and the Scholastic Software Evaluation form developed by Poirot and Billings (1982).

Examining each of the four major category headings appears to be the most productive means of analyzing the data in Table 1. The first seven columns focus on the biographical/bibliographical category. The forms distributed by the National Council of Teachers of Mathematics (NCTM), Burke (1982), and the Educational Products Information Exchange (EPIE) acknowledge the existence of all seven potential issues and allows for some form of evaluation of each issue. Poirot and Billings (1982) omits only the issue of cost.

The next three columns address program content. Six of the instruments deal with all three issues. Burke (1982) fails to address any of the issues while the Pennsylvania

TABLE 1

CONTENT OF EVALUATION INSTRUMENTS

INSTRUMENT (YEAR)	STUDENT DATA	NAME SUBJECT	GRADE LEVEL	COMPUTER TYPE	MEMORY ETC REQUIREMENTS	PROGRAM TYPE	PROGRAM ACCURACY	TEACHING AID	ATTENTION INTEREST	CLARITY OF PURPOSE ETC	FIELD TESTING
LONG (1	Y	N	N	Y	N	N	Y	Y	Y	Y	N
NCTM	Y	Y	Y	Y	Y	Y	N	Y	N	Y	Y
PENN STATE	Y	Y	Y	Y	N	N	Y	Y	N	Y	Y
NAREL	Y	N	Y	N	N	N	N	Y	Y	Y	Y
BURKE	Y	Y	Y	Y	Y	Y	N	N	N	N	Y
EPIE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SWETLOW	Y	Y	Y	Y	N	N	N	Y	Y	Y	Y
MES	N	N	Y	Y	N	N	N	Y	Y	Y	Y
BUROS	Y	N	Y	Y	Y	Y	Y	Y	Y	N	N

...OUR # GRADE	PREREQUISITE SKILLS	RELATED MATERIALS	LLARITY OF DIRECTIONS SOUND	RECORD KEEPING	GRAPHICS/ ANIMATION/	TIME REQUIRED	LESSON DIFFICULTY	WRITING QUALITY	# OF STUDENTS TO USE	FINAL RECOMMENDATIONS
Y	Y	Y	Y	N	N	N	N	Y	N	Y
Y	Y	Y	Y	N	Y	Y	Y	N	Y	N
Y	N	Y	N	Y	N	N	Y	N	N	Y
Y	N	Y	Y	N	Y	N	N	Y	N	Y
Y	N	N	Y	Y	Y	Y	N	Y	N	N
Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y
Y	Y	Y	Y	N	Y	Y	N	Y	N	N
Y	Y	Y	Y	N	Y	N	Y	N	N	Y
Y	N	Y	Y	Y	Y	Y	Y	N	N	Y

State document and the NCTM document fail to address one and two of the issues respectively.

The next six columns address issues of program documentation. Four instruments receive perfect scores in this area. The instruments are NCTM, EPIE, Dresden (1982), and the Minnesota Educational Computing Consortium (MECC). The Conduit and Northwest Regional Educational Laboratory (NWREL) instruments miss on only one of the six issues.

The last seven columns address issues related to special characteristics. The Poirot and Billings (1982) and the EPIE instruments both omit two issues in this category. The remaining instruments reflect a mixture of omissions culminating with Conduit's high of five omissions out of seven issues.

The EPIE instrument fares best when the content of each instrument is viewed separately. EPIE misses only two issues out of a total of 23. The instruments from NCTM, Poirot and Billings (1982), and Dresden (1982) are next with five, six, and seven omissions respectively. On the surface, the EPIE instrument appears to be the best instrument available. However, the instrument is 12-pages long. Therefore, what the instrument may gain in completeness it may lose in it's length. The instrument is not user friendly.

The following evaluation instrument is based on the results listed above. The biographical/bibliographical data will be obtained from page 1 of the NCTM (1981) instrument. The combining of the two instruments addresses all issues in the documentation area. When the two instruments are combined the issues of record keeping, lesson difficulty, and number of students to use remain unaddressed in the special characteristics area. Therefore, the NCTM instrument was altered to accommodate the three missing issues. No questions were removed or altered in the original NCTM instrument. See Appendix A for the combined and revised CAI evaluation instrument.

It is contended here that the world does not have to rediscover the wheel at every turn. The same philosophy holds true for evaluation instruments. When the NWREL and

NCTM are combined and slightly altered, the result is a compact and useful evaluation instrument. When used correctly by CAI purchasers, authors, reviewers or publishers, the instrument should serve both an educational and discriminative function. The instrument should educate each audience of what is important in CAI software and allow each audience to determine how each individual program stacks up against the criteria. Such a comparison should result in more informed and more critical decisions in the area of CAI software.

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Chapter 5

The Status of Computer Simulation in Speech Communication

Thomas R. King

The first computer simulations in psychology began as early as 1958 (Abelson 1968). The earliest reference to computer simulation in speech communication research was given by Bormann (1965) when he described simulation as one of the uses for the computer. In 1970, Clevenger optimistically predicted extensive use of computer simulation in future communication research:

> "Nevertheless, it can be predicted that simulation will play a key role in the development of theory and research in communication. Simulation is particularly appropriate where theory is complex and where direct experimentation on some of the variables is difficult or impossible because of the dynamic nature of the process. Since it is widely recognized that any adequate analysis of communication will prove both complex and dynamic, it seems likely that simulation holds the key to future theoretical developments in the field and thus will play a significant role in the development of communication research."

Capella (1977) reported that computer simulations have been almost totally ignored in the field of communication. The current paper will show that scholars in communication still have reported little use of computer simulation.

The accompanying bibliography is a survey of the references to computer simulation with emphasis on the speech communication literature, which is defined as the journals included in the Index to Journals in Communication Studies Through 1979. All subsequent issues of these journals have been examined individually. An ERIC search of all references with the descriptors "computers" and "simulation" since 1976 was conducted. The search revealed

239 listings. The relevant documents are included in the bibliography. Books on computer simulation which were available in the Florida State University library and are relevant to the field of communication are also included.

This chapter discusses the use of computer simulation in research and teaching in the field of communication, and make recommendations for action by the Speech Communication Association to encourage further research using computer simulation and further development of instructional materials using computer simulation.

Computer Simulations for Research

One objection to much communication research is that it is too simplistic. In most studies, one proposition is tested at a time while holding the other variables constant. This situation never occurs in real life. Changes in one variable can produce multiple changes in other variables. Even the increasing use of multivariate analysis does not correct for this difficulty in our research. The development of computer simulation makes it possible to present complex theories and perform "experiments" on the theories without use of human subjects. The results of the simulation would help to confirm the theory, lead to modification of the theory, or show the need for further experimentation using the computer and/or live subjects (Clevenger, 1970).

Abelson (1968) recommended that the type of problem which best lends itself to computer simulation is one which might be called a "middle-level" problem, one that is too complex to be handled by traditional methods and yet not so huge as to prevent analysis. Most areas of interest in communication research appear to fall in this category.

Bauer and Wade (1982) succinctly state the case for using computer simulation:

> Designing a computer simulation model is one method of studying a system or process in order to develop or test a theory.... Computer simulation can be more easily manipulated than the real-world system it is simulating, and it takes

only minutes to simulate real-world functions that otherwise would take months or years to observe.... Proposed solutions to problems in the real-world can be examined in a simulation by altering the input to the computer model, by changing the variable relationships, or by adding or deleting variables....

Computer simulation has been extensively used in our sister disciplines. Starbuck and Dutton (1971) reported finding 1,921 articles and documents on computer simulation of human behavior that were published before 1969. The wide variety of types of studies suggest that such research is possible in speech communication. Loehlin (1962, 1963) developed a program that simulates human personality and the personality changes with new experiences. Gullahorn and Gullahorn (1963) tested George Homans' theory of interpersonal behavior. Abelson and Carroll (1965) developed a model of an attitude system. Aburdene (1982) tested the Volterra model for the diffusion of a rumor. Miller (1981) simulated sentence encoding, verification, and recall. Denker and others (1981) developed a simulation of a model of long-range stability in marital dyads. Hare (1961) simulated interaction in small groups. Roby and Nickerson (1964) also simulated small group behavior. McWhinney (1964) simulated communication networks. All of the above studies were selected because they are relevant to speech communication; however, the studies were done by researchers outside our field and were reported in journals outside our field.

The most extensive use of computer simulation in speech communication was reported by by William B. Lashbrook and his associates (Hylton and Lashbrook, 1972; Lashbrook and Sullivan, 1973, Richmond, Groescher, Paterline, and Springhorn, 1975; Lashbrook, Snavely, and Sullivan, 1977). They developed and tested a computer simulation named ARISTOTLE which took data showing what proportion of an audience was for a proposition, against it, neutral, and apathetic. The simulation tests the probable effect of a message on the audience and makes recommendations about phrasing the message as one-sided, two-sided, positive, negative, or ambiguous. The various studies tested the predictions by ARISTOTLE by administering the recommended

speeches to audiences and seeing how well the results matched the predictions of the computer simulation.

Pavitt and Cappella (1979) investigated accuracy of predictions in interpersonal and small group discussions. They developed models for each of three different types of tasks. A computer simulation was developed for each of the three models. The unexpected results they received from the simulations is further proof of the value of such simulations in testing theories.

Bauer and Wade (1982) conducted the only other communication study using computer simulation. They said, "Because of the complexity of non-linear relationships of numerous diffusion variables, computer simulation appears particularly appropriate for testing Rogers and Shoemaker's model of diffusion of innovation." The model included possibilities of adoption, rejection, discontinuance, later adoption, readoption, and confirmation. It also included the five main characteristics of the innovation which affect the rate of adoption. Additional variables also included a set of social system variables, the change agent's promotion efforts, and the quantity and frequency of information provided by the change agent. They concluded that their simulation was the first social-communication model to include the full diffusion of innovation process. The discovery that the model needed further modification in light of the simulation shows the value of computer simulation.

Computer Simulations for Instruction

Simulation has been a form of instruction in speech communication since public speaking was first taught by the ancient Greeks. The student delivered his speech to the instructor and possibly his fellow classmates instead of giving it to a "real-world" audience. The instructor evaluated the simulated speech, estimated its probable effect on an audience, and taught methods for improving the student's next simulation. Many of the experiential learning exercises in classes in interpersonal communication are simulations. Educational debate began as a simulation of "real-life" debate in the law courts and legislative assemblies. The movement from the NDT style of debate to

CEDA style comes from a belief that NDT debates have become an unrealistic simulation of "real-life" debate. Over a decade ago, Gorden (1969a, 1969b) and Tucker (1968) advocated that communication instructors add simulation games to their instructional strategies.

Tucker (1968) made the first references to computer simulation as an instructional technique for speech communication, but he was not able at that time to make any concrete suggestions for computer simulations. The first discussion of the use of computer simulation in teaching speech communication was an article by Jandt (1972). Jandt discussed the computer simulations currently being used to teach business students and how they could be used in interpersonal communication classes. Shortly after the publication of Jandt's article, Park (1972) wrote a paper describing the need for computer simulations for speech communication instruction and made suggestions for simulations which could be programmed for communication classes. This early interest has lain dormant since then.

Computer simulation is extensively used to teach business (Jandt, 1972; Nilsen, 1983), biology, physics, mathematics, social sciences, and the humanities (Organization for Economic Cooperation and Development, 1976). One cannot find instructional computer simulations written by speech communication instructors for speech communication courses. If they exist, they do not appear in our literature.

Apparently, computer simulation would be an appropriate instructional strategy for communication courses. Ellinger and Brown (1979) said that it is "exceptionally effective for teaching process concepts, the interrelationship between process concepts and multi-faceted/multi-step problem solving." Much of the content considered in communication courses fits this description. Process concepts are difficult to teach by traditional methods since lectures and textbooks cannot show the process in action. Computer simulations would allow observation by either slowing down or speeding up the processes (Ellinger and Brown, 1979). Interrelationships are difficult to teach because traditional methods are static and the cause-effect relationships cannot be demonstrated, only described (Ellinger and Brown, 1979). Multi-faceted problem-solving would

include many areas of communication instruction, such as conducting problem-solving group discussions, constructing a public speech and designing an advertising campaign. Such instruction usually requires repeated practice since the student learns by doing (Ellinger and Brown, 1979). Traditional instructional methods provide only limited practice in making the decisions needed for the problem solving. For example, in a public speaking class, the student makes only five or six speeches in a semester. By computer simulation, he could make the strategy decisions relevant to public speaking more than five or six times in an hour, and he could learn immediately the probable effects of his decisions.

Dennis (1979) identified three types of computer simulations: replicable performance simulations, informational retrieval simulations, and encounter simulations. All three of these types are relevant to speech communication. In replicable performance simulations, the learning outcome is an expected replication of a specifiable performance. Examples of this type of simulation would include flight simulations and medical diagnostic examinations. In communication classes, the student could be taught by simulation to operate a television control panel or to preside over a meeting. In information retrieval simulations, the learning outcome is information in the form of facts, principles, or understanding. Examples of this type of simulation include processes like genetics and economic systems. In communication classes, these might include the process of communication and attribution theory. In encounter simulations, the student is to "experience" a situation. These might include business competition and disciplining students. In communication classes, the student could experience handling hostile audiences and an employment interview.

Communication teachers may find fruitful areas for computer simulation by observing where instructors in other disciplines are using them successfully. In our research methods courses, students would learn more by simulating experiments or sampling methods than by hearing or reading about the. Kervin and Gates (1976) report the use of simulations to prepare students for research projects in sociology. Gilbert (1978) describes how a computer program can simulate four techniques of town sampling and shows the

effects of the different types of samples. Gilbert has made this program available in commercial form under the name of "SWAMP: Survey Sampling." Anderson describes a computer game for experimental psychology which compresses the activities of years in a research laboratory and shows the effects of longitudinal research projects to the students. Commercial software simulating experiments is already on the market and has only to be purchased to be used in communication classes. "Nature of Attitudes and Attitude Change" contains three data-generating models demonstrating classic experiments in persuasion. The experiments include counter-attitudinal behavior, the sleeper effect, and Hovland's research on the locus of effect in attitude change. "Interpersonal Dynamics" contains three data-generating models for group dynamics studies in aggression, crowding, and conformity. The only study found using computer simulation for instruction in speech communication was by Baxter (1979). Baxter reported using a program designed for social psychology, EXPER SIM, to let her students simulate the experimental research process from hypothesis formulation through data collection. The simulation produced results which corresponded to the theoretical model of how the variables actually function in "real life."

"Jury Selection: A Simulation" by Greenberg (1978) is a simplistic simulation of the effects of different demographic characteristics in jury selection. The student is able to challenge jurors and see the probable voting behavior of the jurors that are finally seated. It is similar to the techniques used by many practicing attorneys. An improved version of this simulation could be used in teaching audience analysis.

Loper and Stang (1982) simulated four students who varied in knowledge and initiative. Student teachers interacted verbally with these "students." The student teachers saw the effects of their different styles of interactions on the behavior of their "students." Similar programs could be written for interpersonal communication and small group discussion.

A number of programs have been written to provide medical students with practice interviewing patients and making diagnoses. One such study by Berven and Scofield (1980) provides the medical student with a background description of the "patient" complete with audio recording,

films, and videotapes. The student requests other information from the patient and from lab tests, and finally makes a diagnosis and recommends treatment. The student learns immediately whether or not he followed the appropriate procedure. Similar programs could be written for speech correction and even for employment interviewing.

Murphy, Hines, and Debenham (1982) describe an interactive computer model that synthesizes collective bergaining theories. The student bargains for the teachers' union while the computer plays the part of the board of education. A simplar form of a collective bargaining simulation is commercially available under the name "Bargain." Similar programs could be developed for courses in group discussion and persuasion.

Straumanis (1977) reports on a simulation for teaching symbolic logic. The student learns to do proofs by typing them into the computer. The computer serves as a line-by-line proof checker. The student is thus provided with individualization and immediate feedback. In speech communication classes, a similar program could be developed to simulate traditional logic or the Toulmin model.

Several commercial software packages are available which simulate the decisions made while conducting a presidential election campaign. "Hat in the Ring" and "President Elect" allows the student to make a variety of campaign decisions and see the effects over the several weeks leading up to the election. These programs may be useful in their present form in persuasion, mass communication, and campaign communication classes.

"Change Agent" and "Diffusion Game" are commercial software which simulate the decisions made in diffusion of innovation. They may be useful in persuasion and campaign communication classes in their present form.

Suggestion for the Speech Communication Association

Since computer simulations appear to be a worthwhile research and instructional technique, and since professionals in speech communication are not actively using this

technique, the Speech Communication Association should actively encourage computer simulations by its members. The following suggestions might be implemented:

1. Short courses on both uses of computer simulation should be included at future conventions.

2. Programs on computer simulations should be solicited by the Instructional Development Division and the Rhetorical and Communication Theory Division.

3. A bibliography on computer simulation should be published in Communication Education.

4. Once instructional simulations have been developed, they should be published in some form to be available to other instructors. Printed versions of the program would probably be too long to include in Communication Education, but they may be placed in ERIC.

5. The SCA should investigate providing prerecorded disks to make implementation of computer simulation convenient to members.

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Chapter 6

Computers and People Working Together

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George Orwell's 1984 describes a society controlled and monitored by machines; people without control of their lives, without choice. Those who successfully resisted "Big Brother" did so only because they refused to surrender their humanness. Prior to 1984, numerous writers projected Orwell's fiction to real events and people. Some even saw the rapid growth of computer use as fitting the mold of Orwell's world. While there is no doubt many people misuse computers and many more advocate uses which are inappropriate, the computer is not a monster to be feared. The computer is a tool to use, not to worship or burn at the stake. Any tool is only as good as the person using it. The more people learn to use computers effectiveiy and efficiently, the less likely is abuse and misuse.

A few years ago, professionals in speech communication helped many educators understand that a fourth R needed to be added to the traditional three R's of "readin', ritin', and rithmatic." The fourth R is relating. The importance of relating has never been any more central to the survival of our society than it will be in the future.

The advent of the information age and the introduction of the computer into the school, home, and work place in massive numbers created another frightening three R's in education circles--reluctance, resistance, and revulsion. The norm has become to put down the growth of the computer by dwelling on its' potential weaknesses and stating the obvious, such as "It is just an expensive video game that will warp our kids' values;" or "It will never take the place of the teacher." Fortunately, a few educators embraced the critically important fourth R of the information age--renaissance or renewal. Those who recognize the potential and inevitability of our new world of information see the computer not just as a useful tool, but as a

necessary one. The changes resulting from American society's movement into an information society may not follow the exact pattern suggested in Toffler's Third Wave (1980) or Naisbitt's Megatrends (1984), but then neither author offers a precise formula for the future. In fact, they both point to broad, general trends rather than to specific time lines for tomorrow's events. However, there is no question our society is changing.

The academic community is in the midst of the most significant revolution since the invention of the printing press. The printing press made multiple copies of textbooks feasible and thereby made mass education a reality. Today, computer technology challenges, at all levels, the very fiber of education as we have known it. The presence of the computer in substantial numbers in the home and work place will force educators, at all levels, to introduce micro-computers into the classroom. The presence of the computer will force us to change our whole concept of teaching and learning. This theme is skillfully developed by Seymour Papert (1980) and has been echoed by countless futurists in the past few years. Pournelle (1983) underscores my contention when he writes: "The educational potential of computers hasn't even been touched. . . . it's better that kids program computers than that the computer programs the kids. . . ." (p. 240). Benjamin Compaine (1983) says we will have to change our definition of literacy from the ability to read, write, and calculate to the ability to use the computer as a tool. It is this "new" literacy which will cause us all to tremble. The ultimate form of the trauma will confront us all when a very normal and average youngster of seven to nine years of age begins to talk to us in computer terms, we neither understand nor appreciate. In fact, some of us have already had the experience several times.

By the end of 1985, nine of ten adult jobs will involve the use of some type of computer, according to John Hayman (1983). Some of the implications of this fact are discussed by Gantt (1983) when describing the role of the communication specialist in achieving computing literacy. While there are numerous pieces of dramatic data to point to the imminent revolution, one more bit will suffice. In the Fall of 1979, there were 400 on-line databases. In the Fall of 1982, there were 1133, and the estimate for Spring 1983

was 1600 (Cuadra, 1983) What does this mean? Information is a commodity to be bought and sold. Furthermore, we must all become information brokers to the degree that we know how to retrieve it and how it is stored. As the information age expands, our most acute problem will not be information overload as one might expect. The number one crisis point will be the gap between those individuals who can function in the information society and those who cannot.

If you are not angry, frustrated, intimidated, frightened or some similar emotion by this point, I have a suggestion: Pinch yourself to see if you are alive and awake. Don't panic, whatever you do, because there is hope! I feel a judicious application of interpersonal communication principles will help us deal with computer revolution in a productive and beneficial manner (Gantt, 1984).

One threat emanating from the machine is the depreciation of self-worth. Since the computer can handle complex logical operations with considerable speed and accuracy, we often feel inferior. We then fall into a trap of self-fulfilling prophecy and become convinced that the machine is "smarter" than we are. Then we take the next step--avoidance. However, denial will not change the facts outlined above or forestall the inevitable. In fact, the computer may replace big government in sustaining the self-help movement begun in the 1970's (Naisbitt, 1984).

If the above scenario does not fit, its' converse probably does. We may understand how to deal with computer concepts and jargon, and thus begin to think we are superior to those who do not understand. In a similar vein, we may only understand enough to be dangerous and in that case, feign superiority as a self-defense mechanism (Gantt, 1984).

Our salvation, in either case, is to recognize that a computer can only do what some human has programmed it to do and that it is our tool. We are not really at the mercy of the computer. We are only at the mercy of those people who think they are at the mercy of the machine. Remember that the computer is the creation of man, not the reverse. As our tools get more and more complex, we understand

ourselves better and better (Gantt, 1984). Floyd Kvamme (1983), an Apple executive, recently made three sage observations: (1) people enjoy creative work and computers are creative tools; (2) computers will improve personal productivity; and (3) computers will become more people-like in the next five years. These three observations take on some degree of power if we remember what we learned in General Semantics and do not confuse the thing with the symbol. The computer is a tool of man and not his ultimate replacement.

It is possible we may have to reevaluate our personal values if we are to preserve our self-worth, but then value clarification is usually a beneficial activity. Being more rational does not require the elimination of feelings, but might necessitate a realignment of proportion. We can not allow rationality to replace subjectivity so we must better appreciate the balance. The computer can never improve on the beauty of oceans, mountains, wilderness, music played by a sensitive performer, or art produced by a starving painter, potter, or sculptor. Computers do not feel; only people feel. A computer cannot care or show empathy. In short, our self-worth should not be diminished by a most wonderful and powerful tool which can be used to enhance our humanity rather than destroy it. In truth, only we have the power to destroy our humanness (Gantt, 1983).

Another real danger for us is the power of fantasy. If television causes you to shudder when you consider what your children or grandchildren might think is real, visit a video arcade or sit down in front of a computer and "interact" with the computer to play chess or any number of other "games." The fantasy world created by television cannot hold a candle to that generated by an Apollo "Flight Simulator." The illusion fostered by "interacting" with the computer is unequaled. The confusion of fantasy and reality could easily become a national disgrace.

However, communication principles help us to separate fact, interference, and judgment if we will apply them and teach by example. We also must perceive, through the process of selection, what is there, not what we want to be there. Search for what is real (Gantt, 1984)!

Equally troubling is our tendency to anthropomorphize when we talk about computers. We describe the computer as "talking, thinking, listening, remembering, or even having intelligence." Often the words are set off in quotation marks, but too often they are not. The computer is assigned human traits and invested with human skills because it is a man-made, electronic analog of the human brain. The fact that the computer came into existence from an analogy to the human brain is not problematic. However, using human functions to refer to the machine is dehumanizing to the highest order. It is much like advertisers using beauty and sex to sell products. We soon come to believe we should all have the degree of beauty reflected in the commercial or we are abnormal. Likewise, if we do not "think" as fast as the computer, we are slow or lacking in intelligence. Computers don't have intelligence. They only make choices from the field of possible choices they are given (programmed to choose from) and can only expand the field if they are given explicit and logical rules for expansion. However, the gravity of the problem we face is clearly illustrated in a publication of the University of Connecticut describing a computer system developed there: ". . . ACE is quite a formidable talker, always clarifying, always keeping the conversation under control. . . .(1983, p. 13)." The article clearly presents the logical processes used by ACE; but when the system's operations are illustrated, ACE is described in human terms.

However, we are not the only ones concerned with value issues related to computer use. David DeLong (1983) describes a workshop attended by 18 computer users considering the topic: "Computers and Personal Values." Of the six major questions explored by the group and reported in DeLong's account of the workshop, one appears particularly pertinent to those of us in Speech Communication: "What is the impact of computers on our self-esteem and our interpersonal relationships?" (p. 33). While DeLong's report does little to answer this critical question, the workshop participants did generate several ideas which could help anyone deal with the new technology and might give our task force a focal point for work with the issue of the person vs. the computer. The following suggestions from the group appear, in my mind, to weigh most heavily on the role of Speech Communicators:

--Sense both dangers and opportunities concerning the use of computers.

--Retain a hold on human goals.

--Balance a computer and other activities.

--Be open about our knowledge--and our ignorance.

--Live a "sober" life, avoiding computer intoxication.

--Ask: What portion of my life does my computer deserve?

--Avoid fleeing to the computer when personal relationships are unsatisfactory.

--Strive to reconcile work with computers and self-image.

--Stay aware of data accuracy and reliability (p. 35).

While there are numerous issues imbedded in the above suggestions, some stand out more than others for the communication professional. For example, the role of goals and values is central to effective interpersonal interactions. People must feel as well as think. The computer can only help with cognitive activities and should be considered a tool, nothing more.

A second example comes from those persons who turn to computers because their relationships with people provide less than satisfactory results. Maybe we need to do more to extol the virtues of a good course in interpersonal communication along with courses in computer and computing literacy.

A third concern comes from the idea that we need to "strive to reconcile work with computers and self-image." While one can easily begin to feel very foolish when working with computers, it helps to study enough to learn their limits and remember that we are able to be less precise when dealing with other humans because of our ability to infer and

interpret--something the computer can do only in so far as it is given defined boundaries.

The final sobering thought comes from the last point in the DeLong list, and that is the reminder that no matter how fast or how accurately the computer works--garbage in, garbage out. The machine depends on accurate input for accurate and reliable output.

I believe SCA needs to address at least three issues, because the following issues are of the utmost concern to the whole membership of the profession.

Of paramount importance is an SCA position on "communicating" with computers. Since the machine cannot "talk" or "think," we must lead the fight for better accuracy of expression when describing computer activities, as well as person/computer activities. We diminish our own humanity and that of others most often without considering the accuracy or appropriateness of our language.

Second, we must take the lead in stressing the importance of person-to-person contact in order to remain human. We know that people who have lived with animals have become more animal-like. The inescapable, yet frightening corollary would be--people who live with machines will become machine-like.

Finally, the fact that computers lack emotion and are incapable of replicating human feelings must be emphasized. Emotions are a part of living. Without feelings, there is no joy in living. The conclusion of the whole matter is this--computers can neither evaluate nor produce emotion. This fact alone will keep man apart from the machine through at least the year 2001.

The plot of the highly successful movie War Games is indeed plausible if we invest machines with human qualities and behave as though we think the machines are human, or worse yet, an errorless super-human. SCA should lead the professional world in cleaning up our language and encouraging productive people/machine relationships with the computer--the most significant tool ever developed by man (to date). The speech communication profession offers us high-touch for the high-tech age.

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