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ABSTRACT

This document presents summaries of conference presentations which attempted to assess how computer and communications technologies can be harnessed to meet the special needs of elderly people. Each of the eight sessions of the conference opened with experts discussing their respective research projects and electronic technologies: their origins, current status, research implications, lessons learned, and likely future applications. These presentations are summarized: (1) "'Downstreaming' New Technologies to Older Americans" (James Gollub); (2) "Prodigy, a New Electronic-text Information Service" (Suzanne Biegel); (3) "Audiotex Services and the Elderly" (Bruce Kushnick); (4) "Computers as a Tool Facilitating Transition to Retirement" (Tora Bikson); (5) "Electronic Mail and the Elderly" (Sara Czaja); (6) "Videotape "Visits" with Institutionalized Individuals" (Karen Warburton); and (7) "Employment Prospects for the Elderly" (H. R. Moody). The final session was devoted to exploring participants' special hopes for how new electronic technologies would evolve to serve the elderly. The report concludes that although the conference did not come up with clear conclusions about the future, it did illuminate some of the issues that must be dealt with if new electronic technologies are to be successfully designed, marketed, and effectively used by elderly Americans. (ABL)

Communications and Society
FORUM REPORT

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1989 REVIEW CONFERENCE ON NEW ELECTRONIC TECHNOLOGIES FOR THE ELDERLY: Issues and Projects

Report of an Aspen Institute Conference
Wye Woods Conference Center
Queenstown, Maryland
May 8-10, 1989

by
David Bollier
Contributing Editor
CHANNELS Magazine

*This is **FORUM REPORT** #11 in a series intended to invite wider interest in the concerns and activities of the Aspen Institute Project on Enhancing the Social Benefits of New Electronic Technologies, supported by a grant from the John and Mary R. Markle Foundation.*

The Aspen Institute

An independent, international, nonprofit organization, the Aspen Institute brings together leading citizens to discuss issues of lasting significance. Its Program on Communications and Society serves as an impartial forum for assessing the importance of modern communications and information systems to the ideals and practices of democratic society.

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1989 REVIEW CONFERENCE ON NEW ELECTRONIC TECHNOLOGIES FOR THE ELDERLY: ISSUES AND PROJECTS

On May 8-10, 1989, a diverse group of twenty-one experts met at The Aspen Institute's Wye Conference Center in Queenstown, Maryland, to assess how computer and communications technologies can be harnessed to meet the special needs of elderly people. The conference, the fifth in a continuing series, featured presentations about several demonstrations of new technologies and research projects. Most of the projects reviewed by participants and the gathering itself were made possible by funding from The Markle Foundation.

Each of the eight sessions of the conference opened with experts discussing their respective research projects and electronic technologies: their origins, current status, research implications, lessons learned, and likely future applications. The discussion of each individual project, in turn, elicited rich insights into the special challenges of making new electronic technologies useful to the elderly.

Conference participants included gerontologists, elderly care providers, analysts at major private research institutes, marketing strategists for computer companies, public affairs representatives from telephone companies, an industrial engineer, a public health professor, an independent video producer, and others. Sitting in for Michael Rice, Director of The Aspen Institute's Program on Communications and Society, who was unable to attend and serve as moderator, was Christopher J. Makins, Vice President-Policy Programs for The Aspen Institute.

I. "Downstreaming" New Technologies to Older Americans

The first session was opened by James O. Gollub, Senior Analyst at SRI International and Director of Life Span, a multidisciplinary program that provides market research to business and government on the distinctive characteristics of elderly consumers.

In developing new electronic technologies for the elderly, Gollub said that people's ages are really less important than their functional requirements. Furthermore, the elderly of each generation have different attitudes and identities, reflecting the special historical and cultural experiences of each generational cohort.

To translate this phenomenon into an analytic framework, Gollub and his colleagues developed the "Life Span" model, which articulates the subtle differences in character among succeeding generations of elderly people. "We're all born into particular periods of human history," Gollub explained. "Those periods of time affect us differently, depending upon what stage of development we're at. If you were 12 years old when President Kennedy was assassinated, it meant something very different than if you were 25 years old."

Gollub calls these different experiences "time signatures" -- collective experiences that define the "rhythm" of a particular generation and give it a unique psychological profile. People born within the same time period obviously differ a great deal, also. Gollub ascribes these differences as the unique "birthmarks" everyone has -- the product of being born with different personalities and growing up in different families, neighborhoods, schools, etc. One focus of Gollub's work is to try to measure the "birthmarks" and identify similar personality types within different "time signatures." The Life Span project does this by analyzing the predictable rites of passage and stages of development in a person's life. Throughout all the transitions in a typical person's life, Gollub believes that the enterprise common to each stage is the structuring of values.

In the context of an aging/values matrix, the Life Span model breaks the U.S. population since 1900 into a series of "time signature" groups, each with its own name and personality attributes. Gollub described a few elderly cohort groups he has identified and named:

> 1900-1910: Children of the Century. A generation marked by struggles and achievement, this is the first American generation to be "entitled" to retire, and is often surprised to have made it. Half are old-world immigrants; they grew up without phones or interstate highways in a time of emerging public services, social welfare programs, and entrepreneurial tinkering.
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> Gollub finds four distinctive personality types in this group: 1) Preservers, who are often immigrants, highly dependent and live in cloistered social environments; 2) Adopters, immigrants who eagerly sought to assimilate and become all-American; 3) Pragmatists, who are native-born and raised in a tradition of hard work, thrift and trust; and 4) Explorers, who are very independent and eager to maintain their autonomy.

1911-1920: Those of the Dream Deferred. This generation deferred many personal choices and self-gratification (such as college, marriage and careers), largely because of the Depression. This is a disappointed cohort whose members either feel guilty for the loss they experienced or are trying to overcompensate for it.

Distinctive personality types in this group include: 1) Martyrs, who experienced self-denial and are unable to get self-gratification by fulfilling themselves; 2) Self-compensators, who are trying to make up for what life denied them; 3) Clock-watchers, who are stable, adaptive and family-oriented; and 4) Conservers, social strivers who were born on the edges of industrial communities.

The value of the Life Span analytic framework, said Gollub, is in providing a more sensitive psychographic segmentation of the elderly population for business and government. In a recent study he prepared for the Social Security Administration, Gollub used the Life Span model to study the likely impact of generational changes on retirement. One major conclusion of his study was that the number of early retirees would probably stay the same but that a greater number of retirees than previously would also enter the workforce.

Besides assisting in government planning, the Life Span method is also used to analyze consumer behavior in the marketplace, said Gollub, "so that we can begin to influence how products are developed, marketed and applied." Given the steady evolution of generational cohorts, said Gollub, "a product is not an enduring thing." In order to retain its market share, either a product or its marketing must change over time, he said.

Gollub explained that when he and his associates do "birthmark analyses" of an elderly cohort, they devise "a set of psychological constructs" germane to that particular product so that they can acquire "measures of behavior which are useful to predict how a person will respond to a product." For example, in designing a retirement community, a housing developer might find it useful to know how potential purchasers feel about matters of personal autonomy and dependence, because that might affect whether the development should offer private decks, "viewscapes" or special caretaking functions. Other concerns: How do the prospective clients feel about matters of self-indulgence versus denial? Are they more extroverted or introverted? Are they open to change or closed to change? The answers would affect how the product or service might be designed and marketed.

One problem faced by SRI and other research institutes is a ertaining the most logical, useful applications of new electronic technologies. At the moment, commercial applications arise through a process of "technology-push," said Gollub; there is an absence of social institutions to identify prospective applications of emerging technologies for specific market segments. The challenge is to redesign the early development process for new technologies to take account of actual consumer needs. Life Span psychographic analysis offers one way to bridge the gap between infant technologies and human needs, Gollub suggested.

To illustrate the kinds of raw, undeveloped technology that could be adapted for specific uses, Gollub showed a videotape that demonstrated the artificial intelligence capabilities of "Flakey," an experimental robot with sensors for vision, sound and physical contact, and a speech recognition system. Another technology with largely unexplored applications is DV-I, digital video-interactive, which Gollub explained by playing an audio cassette.

Reactions to the Life Span Model of Market Research

Eileen Connell, Associate at Greystone Communications, a consulting firm, took issue with an assumption underlying Life Span: "On the one hand you're arguing against ageism; on the other hand you've divided the world into lifespan characteristics and classified people into the decades of their birth." Gollub replied that the concepts of aging that people carry around in their heads have no reliable reference points. Life Span offers categories that can overcome stereotypes.

Dr. Lydia Bronte, Visiting Fellow at Phelps-Stokes Fund, who is doing research on people pursuing careers after age 65, suggested that Life Span's division of elderly cohort groups by decade may be somewhat artificial. Gollub conceded that that categorization was partly a decision of convenience, and cautioned against overly rigorous interpretations of the categories. Life Span is a tool for overcoming myths and seeing demographic groupings more clearly, he said.

Apart from such issues, Tora Bikson, Senior Scientist in the Behavioral Sciences Department of the RAND Corporation, asked Gollub, "How do you decide which aspects of a new technology to transfer or apply to a target population? How can you figure out good transition routes from advanced development labs to actual use?"

Bikson suggested that one of the most productive answers is to consult end-users and involve them in the development process. Even the best developers cannot conceive of all the applications that might interest end-users, and survey research of users will not be successful either, particularly if users have not had hands-on contact with the technology. Gollub agreed that end-users must be consulted but worried that self-selected groups of test participants would skew results.

Has anyone performed any statistical correlations between certain personality types -- e.g., "martyrs" from the "Dream Deferred" cohort -- and their use of certain technologies? asked Bruce Kushnick, President of National TeleVoice, an audiotex consulting firm. Gollub offered some conjectural answers but said he was not aware of any hard data on this issue. Edith Bjornson, Program Officer for the Markle Foundation, interjected that a Markle-sponsored Yankelovich study had examined "techno-phobia" and people's ability to adapt to certain technologies, but not much further research exists.

Suzanne Biegel, Senior Market Planner for Prodigy Services Company, asked Gollub if he would segment a market around those "signature events" of the Life Span model. Gollub replied that the model offers useful general categories but it must be adapted to specific technologies and users. If enough personality types within a "time signature" share common behaviors, for example, several Life Span categories can be merged together.

Biegel also asked Gollub whether a person's stage in life is more important than other criteria for segmenting a market. While conceding that there are obviously other ways to segment a market, Gollub defended Life Span as a means "to understand why people of the same age are different from each other, so that we don't make broad generalizations about 'the youth market,'as if it were homogeneous." Life Span is "like taking VALS [a psycho-demographic tool] a level deeper, for people who need to understand more specific psycho-demographic groupings."

Biegel remained skeptical. Many psycho-demographic models "look great on paper but when you try to implement them and reach people in a 'segmentable' way, they don't work," she observed. This could be a problem with Life Span, too. Gollub replied that the model is a "tool rather than a solution" that can help people who do know how to use it properly.

The Process of Developing New Technologies for End-Users

Is there some mechanism for entrepreneurs to gain access to basic research about how elderly might use new electronic technologies? asked Joseph Sedlak, Director of Domestic Programs at Volunteers in Technical Assistance. Or, alternatively, he asked, is there a way for laboratories to disseminate their work more effectively? While NASA-funded research is accessible, Gollub replied, SRI technologies are proprietary and closely guarded.

The difficulties of locating and using basic research is a real problem, Sedlak continued. He cited a government-funded database, Able Data, which identified inventions and products for disabled people -- but which was hardly used and eventually de-funded. Tora Bikson of the RAND Corporation agreed: "All sorts of literature are buried in all kinds of archives. It is possible to unearth the research, but it takes a lot of time, effort, knowledge and capital investment. Publishing is not enough."

Eileen Connell of Greystone Associates described an unusual market research instrument devised by Citibank. The bank's researchers divide consumers into five quintiles reflecting different levels of skill and comfort with new technologies. People in the first quintile are very comfortable with new systems and buy or use them right away; the fifth quintile is almost phobic about new technologies. When testing a new product still in development, Citibank insists that it test successfully down to the fourth quintile, said Connell, before proceeding to any test in the real-world marketplace. Citibank does not even attempt to modify its prototypes to satisfy people in the fifth quintile.

This research instrument provides a "fabulous acid test" for the likely commercial viability of a new technology, said Connell. The quintile test was first used to assess potential consumer acceptance of the automated cash machine, an innovation that eventually helped Citibank capture half the market share. Connell said that this quintile approach gives Citibank an edge over its competitors in developing new products. It is impressive, she added, that the bank's development department fully supports this research instrument.

Gollub cautioned that market segmentation by quintiles might be too rigid a measure for technologies that have different "transactive characteristics," i.e., new products for which variations in consumer acceptance are too varied to be captured in quintile divisions.

Consumer complaints are a valuable source of market feedback for new technologies and management systems, several participants noted. Eileen Connell of Greystone cited the introduction of high-speed computers in the credit card industry, which allows banks to manage their customer base more responsively. Customers who can call toll-free 800 numbers to inquire about their accounts and receive immediate answers are more satisfied customers. Indeed, since the introduction of high-speed computers and 800 numbers, customer satisfaction rates with their credit cards have risen from 50% to 94% over the past eight years, Connell said.

Susan Walters, Manager, Public Issues, for Pacific Bell, concurred that consumer complaints offer a rich source of insights into a market. A few years ago, consumers complained to Pacific Bell about the poor quality of its complaint-handling process. Because different divisions within the company were so fragmented, the company found it difficult to coordinate responses to consumers effectively. To address the problem, Pacific Bell convened a group of consumers, worked with them for many months, and ended up revamping the organization of the company as a result.

Now Pacific Bell's service representatives can deal with customer problems right over the phone and make arrangements to correct them swiftly. In addition, the company developed a system for channeling consumers' comments to the appropriate people within the company -- be it in product development, product implementation, or policymaking -- so that corrective actions could be taken. The company found that its responsiveness helped its public image immensely: "It quickly became clear that we were organized," said Walters. "We got all kinds of comments about our corporate image, our products and the way we deliver services," said Walters.

II. PRODIGY, A NEW ELECTRONIC-TEXT INFORMATION SERVICE

Suzanne Biegel, Senior Market Planner for Prodigy Services Company, opened the second session with a demonstration and discussion of Prodigy, the new home electronic information service jointly created by Sears, IBM and CBS.

The interactive system allows subscribers to do their banking, pay bills automatically, order merchandise, check the weather forecasts, check stock prices, consult airline flight schedules, obtain Consumer Reports product information, and many other services, from a single home computer terminal. The system also features self-help quizzes, a weekly poll of Prodigy subscribers on timely issues, and a variety of other interactive services designed to educate, entertain or conduct

consumer transactions.

Prodigy is a service designed for home use by average consumers, not computer hobbyists. It requires an Apple MacIntosh computer or an IBM or compatible computer with a graphics card and modem. It costs $10 per month for unlimited use of all Prodigy information services (except banking, whose fees are set by individual banks). There are currently tens of thousands of subscribers, Biegel reported.

One distinctive feature of the Prodigy system is its potential for individualized service. A person who wishes to check her bank account, the weather forecast, horoscope, and five specific stock quotations every morning can program the system to provide sequential access to that information. The system's creative graphics also makes it quite user-friendly.

Another individualized feature is Prodigy's many special-interest "clubs" for gardening, travel, computer use and other concerns, available to subscribers at no extra charge. Through access to electronic bulletin boards, members can share information and develop relationships with other subscribers. It is expected that Prodigy may eventually provide "tiered" information services for specialized groups -- such as certification courses for certain professions, encyclopedias, computerized baseball simulation games for baseball fans, etc. -- which would be available for an additional fee.

The Prodigy system has great appeal for commercial clients because of its rich store of demographic data about consumers. The system tracks use of services along demographic lines, which can be very useful for product development, marketing, and sales. With a few exceptions (such as Consumer Reports), most of Prodigy's information services include advertising on the computer screen. Prodigy's commercial clients also like the system for the ease with which customers can "shop" and order products and services.

Biegel posed several questions that interested her to conference participants: What are the services that Prodigy might develop to serve the elderly? Who would be the most receptive initial elderly audience for advanced technology like Prodigy, and how would it be different from other elderly audiences? Who should be responsible for bringing the technology to the marketplace? What is the most relevant market segmentation? Lifespan? Homebound versus active elderly? Time of year? Technological literacy? What is the likely social impact of Prodigy and other information services?

Impediments to Technology Diffusion

Despite the demonstrable value of introducing new electronic technologies to the elderly, many formidable barriers are impeding diffusion of the technology. The group devoted the rest of this session to this issue.

Tora Bikson of the RAND Corporation worried that the proliferation of multiple, independent information networks with different electronic protocols is sometimes making it more difficult for people to communicate with each other. For example, Prodigy messages cannot be uploaded to a personal computer diskette; SeniorNet is incompatible with Prodigy and with Bietnet, the system used at most universities; Delphi, another system used by the elderly, is also incompatible.

"Someone needs to provide gateway services so you can get from one system to another," Bikson said. "You don't want to have to subscribe to every information system, yet you don't want to create another information monopoly." Susan Walters of Pacific Bell said that her company hoped to provide "protocol conversion" services at some point.

A more basic, difficult issue, said Sara Czaja of the Department of Industrial Engineering at State University of New York at Buffalo, is introducing elderly people to the technology. "A 65-year-old woman living alone, who might be able to use information services, is not going to know what to buy and how to distinguish between different services," said Czaja.

One solution to that problem, it was pointed out, is SeniorNet, a nationwide program sponsored by the Markle Foundation that teaches older people how to use and enjoy computers. The project started out as a research project to see "if older people could in fact learn to use computers with pleasure and skill, in a reasonable period of time," said Edith Bjornson of the Markle Foundation. The project has been quite successful. In three years, Bjornson said, the project has gone from six experimental research sites to about 25 sites nationwide.

Dr. H.R. Moody, Deputy Director of the Brookdale Center on Aging at Hunter College, finds it paradoxical that the people who could benefit most from new electronic technologies, the homebound, are the ones least able to acquire and learn how to use them. Moody considers this "an intrinsic market failure." "Unless a foundation or government comes in," he said, "the market will never address this segment of the market."

James Gollub of SRI took issue with Moody's prescription as "a mistaken view of altruism and how the marketplace works." Gollub said that underserved groups such as the elderly are best served through schemes such as tax subsidies, insurance risk pools, or distributive mechanisms that harness market forces.

One of the most effective ways for diffusing expertise about information technologies, said Susan Walters of Pacific Bell, is through "communities of interest" at schools, senior centers, nursing homes and other social service facilities. People interested in geneological research, for example, may find it easier to learn computer skills as a group.

Tora Bikson of RAND agreed: "Peers are the best sources of technology diffusion. In any group of people who become PC users, there will be some self-selected gurus." The main source of information in some 30 corporations she has studied is "the fellow employee who happens to be very proficient. People enjoy sharing their expertise." Suzanne Biegel of Prodigy added that there "is this tremendous force of recently retired people from IBM, General Dynamics, Lockheed, etc., who we're not leveraging right now."

Biegel told the group about the formation of the Computer Learning Foundation, a nonprofit educational foundation created two years ago by a consortium that includes Apple, IBM, Tandy, Commodore and software publishers. The Foundation's purpose is to sponsor national events that promote the learning of computers for "productivity, learning and fun." Advocates for the elderly might be able to promote computer learning through this group, Biegel suggested.

III. AUDIOTEX SERVICES AND THE ELDERLY

Bruce Kushnick, President of National TeleVoice, a market research consulting firm and publisher of a trade newsletter, Audiotex Now, opened the third session with a discussion of audiotex services.

Kushnick says that there is currently a great "explosion in 'telemedia,' going on." Telemedia, he explained, essentially consist of the various ways of handling phone calls. Telemedia options include systems that handle data phone calls, automatic systems that play recorded messages to callers, speech recognition systems, speech synthesis systems that convert text to speech, and -- an anachronism that retains its appeal -- live operators answering the phone.

Kushnick's company surveyed 1,400 people to assess general consumer attitudes toward telemedia systems -- what people like and don't like about them, what innovations they might come to accept, etc. There are some applications where automation is quite successful, said Kushnick, especially in the financial services market where "people would sometimes rather talk to machines than humans."

The first audiotex system began in the 1930s when New Jersey Bell established separate, automated phone lines for giving weather forecasts and the time of day. The next major stage of audiotex development came in the 1970s, when a handful of phone companies offered "976" services, which allowed phone users to call recorded messages supplied by private information providers. The 1970s also saw a proliferation of toll-free 800 numbers, which gave rise to "telemarketing," a new means of handling consumer complaints, marketing and sales orders.

The latest development in audiotex services is the "voice market," an emerging array of technologies, which includes audiotex (the playing of information); voice messaging (systems that leave and receive phone messages); automatically dialed recorded message players (a machine that dials and transmits a recorded message); speech recognition (a machine that can understand and act upon basic spoken-word commands); and speech synthesis (a machine that reads text and simulates speech). These technologies are "on a collision course" with live-operator services, said Kushnick.

Another recent innovation in the voice market is the 900-prefix telephone call, in which telephone users pay a phone charge to reach a recorded message. Revenues from the calls are shared by the sponsors of the messages and the phone company. To promote his latest record, "Jazzy Jeff" used a 900 line to let his fans hear a recorded message, which elicited two million calls at $2.45 a call. Jazzy Jeff earned more money from the calls than the record itself.

The new 900 service can be used for serious corporate-consumer transactions as well. Access to Prodigy could be arranged on a per-use, per-minute basis via Sprint or MCI, for example, rather than on a monthly fee basis. Financial services companies, too, may well venture into 900 services as a way to sell information to their clients.

In contemplating how these various "telemedia" could serve the elderly, Kushnick said it is first necessary to determine the size of a potential market and its needs and preferences. He cited his "Aunt Sophie's" personal aversion to automated voice services as the sort of consumer preferences that must be identified and accommodated.

It is critical that the technology be employed in ways that serve real needs effectively, Kushnick stressed. The "Talking Yellow Pages," an experiment tried in a few cities, offered potential customers an audiotex supplement to selected ads in the regular yellow pages. But an audiotex elaboration of a print ad may not offer much more value to consumers than a direct telephone inquiry to a merchant.

In using telemedia to help older persons, therefore, Kushnick advised research into what they truly want to hear over the phone. For example, what do the elderly need or want to find out? What kinds of information is conveyed well over the telephone? What particular audiotex technologies are most appropriate? In answering these questions, many contingencies immediately arise:

- Which segment of the elderly population is the envisioned user?
- Is an index for the audiotex available? Scanning a list of information resources is usually easier with print than audiotex.
- How many of the potential users have rotary phones? If it is a large number, a live operator might be needed to connect users with audiotex phone extensions.
- What kind of audiotex services will people pay for, and what kinds should be free? Is the service accessible through local lines, or are there additional charges?
- Is the recorded information perishable, i.e., will it need to be updated frequently?
- With respect to "chat lines," will the anticipated users feel comfortable talking to strangers in such an arrangement?

Tora Bikson of RAND pointed out that the utility of an audiotex service can depend upon whether one is a sender or a receiver, the type of information being sent, and how long the information needs to be retained. Messages that are long or filled with numbers (such as airline schedules) are not well-suited for audio-message systems, at least for those receiving such messages. People sending messages, however, often find it much more convenient to send voice messages than printed messages.

Another concern, pointed out Dr. Marion Perlmutter of the University of Michigan, is that 20-30% of the American population is functionally illiterate; voice-message systems would thus be an advantage for them.

In two 800 services he has used to disseminate information about energy conservation and sustainable agriculture, Joseph Sedlak, Director of Domestic Programs for Volunteers in Technical Assistance, says that "people are thrilled to find a caring, informed human at the other end of the line." Yet in response to their information requests, they prefer to receive written materials, via the mails.

Conveying answers to specific questions can be difficult through audiotex, Kushnick pointed out. A technical assistance expert for Microsoft, the software company, found that he could easily devise the answers to the most frequently asked customer questions, but novice computer users often could not formulate the relevant questions that would elicit the right answers. The lesson: Some human expert was needed at the beginning of the encounter. A general problem with artificial intelligence and other expert systems, said Kushnick, is that they usually cannot deal with complexity in reliable ways; clients, however, want pragmatic results.

The question being neglected in all of this discussion, said Christopher Makins of the Aspen Institute, is what services do the elderly need or want?

Eileen Connell said that posing the question that way is misleading because by the year 2000, the current "baby boom" generation, which will then constitute the elderly, will constitute half of the consumer market, blurring the distinctions of a market segmentation category, "the elderly." On the other hand, these people will have certain inexorable physical deficiencies that offer a generically distinctive characteristic, she said. Just as the federal highway system is now being revamped with better grading of entrances and exits, new sign lettering, etc., to accommodate the elderly, so our communications network may need to make certain accommodations for the elderly, such as the replacement of rotary phones with touch-tone phones, Connell said.

If current trends continue, the elderly will share additional generic traits, said Dr. Marion Perlmutter of the University of Michigan. As a group, the elderly will be disproportionately female, more likely to be homebound, and more flexible in their lifestyles (i.e., they will be able to travel, pursue personal interests, etc.).

Dr. H.R. Moody of Hunter College warned against presuming what elderly people might or might not want based upon abstract categories. "If you had asked retired people 15 years ago, 'Would you go to live in college dormitories during the summertime, take classes, eat the food, share bathrooms, etc.?' people would have thought it an offbeat experience. Today there are over 200,000 who attend the Elderhostel program and 500,000 who subscribe to its newsletter. It's in every continent of the world and all 50 states. It's growing by 20% a year....So you never know where new ideas are going to come from." James Gollub concurred: the segmentation of the elderly population must be built up from empirical fact, not from generalizations imposed by presumption.

One set of empirical facts about the elderly that must be addressed by new electronic technologies, urged Sara Czaja of the State University of New York at Buffalo, is the design of their human interface. As a rule, the elderly have slower cognition and less short-term memory capacity; their visual sensitivities to contrasts are weaker; their visual acuity is weaker, requiring larger print; and their manual dexterity is often diminished because of arthritis. "The challenge is to translate what is known from academic research into the technical design process," said Czaja. For some electronic technologies, market segmentation may not be as important as the physical capabilities of the elderly.

Czaja added that her research showed that the elderly have no predetermined set of attitudes toward computers. The most critical factor is not the technology itself, she said, but the learning experiences people have with it. Those who have had bad learning experiences have negative attitudes toward computers, irrespective of age.

Discussion moved onto how electronic technologies should be designed to meet elderly needs. Tora Bikson of RAND warned, "It is a mistake to over-engineer emerging technologies and assume that basic market research tells us enough. It is critical to put representative groups of expected users 'into the loop' of design and prototype development, and give the technology enough flexibility to evolve to meet user needs."

One problem with making electronic technologies more responsive to the elderly is that there is no "feedback loop" that conveys academic research findings to product or service developers such as Prodigy, said Suzanne Biegel of Prodigy.

To solicit ideas on what audiotex services the elderly might genuinely need or use, Kushnick asked for suggestions from each conference participant. Among the suggestions:

- Get elderly advocates and audiotex experts to talk to each other about possible audiotex applications. (H.R. Moody)

- Institute medical and health monitoring using computers and telephone lines. (Marion Perlmutter)

- Translate technical information about emerging electronic technologies into a more popular idiom, so that the elderly and others can understand what is available. (Kathleen Stutzman and Bob Davidson)

- Prod the electronic technologies industry to address the new ethical and policy issues that their inventions raise. (Eileen Connell)

- Create gateway services that can translate different system protocols and thereby facilitate ease of communication. (Darrell Lauer, Area Manager, Constituency Relations, Southwestern Bell Telephone Co.)

- Develop new technological applications for small but needy users who will never constitute a larger market segment. Example: "Newspapers for the Blind," a service which provides access to individual sections of a newspaper via touchtone telephones. (Darrell Lauer)

IV. COMPUTERS AS A TOOL FACILITATING RETIREMENT PLANNING

The fourth session of the conference featured a report by Tora K. Bikson, Senior Scientist in the Behavioral Sciences Department of the RAND Corporation. She described the results of her one-year field research, which compared the experiences of two teams of seniors assigned to develop recommendations for retirement planning. One team was equipped with a personal computer network to perform its work while the other was not.

The experiment, "Spanning Work and Retirement: Roles for Computer-Based Networks," was designed with several built-in assumptions, Bikson explained. First, it was assumed that the experiment would work best if it used an existing group of people with shared values and interests, i.e., who had predispositions and reasons to communicate with each other. The experiment also assumed that members of the test groups would have certain intrinsic needs served simply by communicating with each other. Finally, Bikson wanted to select a test population for whom there would be some inherent value in exchanging information via computers.

The result was a research project to explore the value of networked computers as communication devices in the transition to retirement. Three questions posed by the experiment were:

1. Can increased interaction between retirees and employees nearing retirement improve the retirement transition for people on both sides of that boundary?

2. Would networked computer systems provide a good medium for task-oriented group interaction and information exchange?

3. How would these technologies serve as vehicles for personal and social relationships?

Participants in the experiment were drawn from the workforce of the Los Angeles Department of Water and Power (DWP), one of the city's largest employers. The advantage of such a pool of participants -- DWP employees nearing retirement and recent DWP retirees -- was that they had a certain homogeneity (same corporate culture, similar retirement options) yet they were not likely to know each other.

Two test groups of 40 people each (20 employed and 20 retired) were formed. Each group was charged with researching and writing a "white paper," which would identify the issues that elderly adults must face in planning their retirements, and suggest strategies for coping with them. The completed papers would then be sent to the DWP's retirement planning group and to other interested parties.

Most participants in the experiment were middle managers and professionals between the ages of 56 and 72; top executives and blue-collar workers were deliberately excluded from the study in order to ensure a relatively homogeneous group of participants and easier social interaction. To test the hypothesis that people would use computer networks for communication whether or not they initially thought they had such an interest, participants were <u>not</u> recruited based on their interest in computers. In fact, no participants knew much about computers. To further neutralize any self-selection among participants, volunteers were randomly assigned to the two test groups.

Members of the first group, dubbed the "standard task force," communicated with each other and prepared their report in the conventional way -- through meetings, telephone calls, letters, memos, etc., which RAND researchers facilitated. The second group, the "electronic task force," was given the identical mission but provided with personal computers, modems,

telephone lines, a starter kit of software (word-processing, spreadsheet, games and BASIC) and networking services.

RAND served as a resource and facilitator for any problems either group encountered, especially in resolving technical computer problems for the electronic task force. But otherwise, each group was autonomous in how it organized itself and its work. Both task forces eventually formed subcommittees to research the issues relating to retirement planning -- health services, financial planning, self-esteem, use of time, family and social adjustment, etc.

RAND researchers monitored the point-to-point communications patterns that were occurring in each group in order to get an idea of the "density" and varieties of communication networks that emerged. It also monitored the usage of computer software programs by each person in the electronic group.

Bikson reported some of the more significant results of the project:

Recognition density. At baseline, about 20% of participants in each group recognized other members in their groups. By the end of the year, 80% of the standard group recognized each other, compared to 90% for the electronic group.

Contact density. Bikson measured the frequency with which participants reported having had some sort of contact with another group member over the preceding two weeks. Among the four subgroups (employees and retirees in the standard group, and employees and retirees in the electronic group), all showed modest gains except the retirees in the electronic group, who dramatically increased their contact with other group members from 10% at the beginning to 50% at the end of the experiment.

Electronic contacts. Telephone contacts were about the same in both groups. But interestingly, the electronic group had more scheduled face-to-face meetings with other group members than the standard group, which had more chance, unscheduled contacts. (By the end of the year, only 12% of the contacts among electronic group members were attributed to "chance" compared to 55% for the standard group.) Bikson believes that members of the electronic task force found it easier to schedule meetings than the standard task force.

Bikson concludes that "electronic communications media do not seem to substitute for other ways of interacting. They were used for things they are intrinsically good for (e.g., scheduling meetings) and to reinforce, augment and enhance other ways of interacting." She also found that electronic media, over time, can help participants who live far from

meeting sites participate more frequently than those without that capability.

Electronic media and group leadership. Another interesting result was how electronic media affected the leadership structure of each task force. Almost all of the subcommittee chairs in the electronic group were retirees (who had plenty of time to learn how to use the computers). In the standard group, most subcommittee chairs were employees. Also, there was a greater variety and number of de facto leaders in the electronic group -- people who emerged as volunteer-experts as specific tasks arose.

Perceptions of group performance. Bikson asked each task force, "How well has your study group done its task?" At first, the standard group had a higher measure of self-performance because it got off to a fast start; its members did not have to spend time learning how to use computers. Members of the electronic group, struggling to learn how to use computers, felt beleaguered. By the end of the experiment, however, members of the electronic group generated a 68-page report and felt that they had done a far better job than the standard group, which apparently concurred; its members, which produced a more modest 14-page report, expressed envy of the electronic group.

Electronic media and group strategies. The nature of the report finally produced by each group differed greatly, due in part to the availability of computers. The standard group's subcommittees were more conventional and inward-looking in their methods. They consulted library resources, other group members and their own experiences. The electronic task force, by contrast, reached out to a broader group by preparing a survey questionnaire which it sent to DWP retirees. Their computers helped them prepare the survey, generate mailing labels, and tabulate and interpret the responses.

Impressions of computer use. Members of the electronic group reported that computer use started out as fun and challenging and became more fun and more challenging. They also reported considerable, persistent frustration.

Lasting effects of the project. Many retirees in the electronic group said they had made some lasting friendships through their participation in the project, although Bikson pointed out that the degree of active participation in the experiment was probably more influential in forming friendships than computer use per se.

At the end of the experiment, DWP employees from both groups reported more positive impressions of retirement, probably a byproduct of their frequent interactions with DWP retirees. Both groups strongly valued the group interaction in retirement planning, particularly in exploring the more personal, emotional dimensions of retirement with peers.

Some members of the electronic task force have continued their association through a newly formed "DWP Club," which acts as a "buying club" to try to obtain group discounts on computer equipment and as a support/liaison group for DWP employees and retirees. The group is creating a "skills directory" that will help match retirees who have certain skills with ad hoc DWP projects. The group is also interested in financial planning, the SeniorNet computer instruction project, and in personal electronic communication with their families.

Bikson said that the electronic task force "became vastly more skilled than we predicted it would." But she conceded that it took many months for participants to acquire enough competency, and that teaching the same amount of computer skill in the course of a week or two would not work.

The value of a computer network for the elderly (and other groups), said Bikson, is that it can serve as "an infrastructure for an active, participatory exchange. It allows people to form communicating groups and social networks. People will find things to do." Like roads and highways, these networks "help you get from place to place and stay in social and intellectual contact with the groups with which you want to be in contact," she said. "The most important thing is to provide the connectivity, then let people to develop their own needs and interests. I think they'll create their own markets."

Commercial developers of such technologies, alas, usually do not have the patience to wait for such markets to materialize. Suzanne Biegel of Prodigy observed that there is an "intense short-term pressure" for new electronic systems to succeed, especially because so much capital investment is involved. The real challenge, no matter what the system, is learning how to get people onto the system, staying on it and using it as routinely as the telephone.

Since the backers of new electronic technologies are essentially trying to change deeply rooted habits of people's daily lives, it will probably take committed visionaries with the money and patience to make the next breakthrough. For the time being, Tora Bikson's experiment gives a glimpse of one set of possibilities.

V. ELECTRONIC MAIL AND THE ELDERLY

Is it feasible for the elderly to have computers in their homes? Would they serve a valuable function? Would people use them? Sara Czaja, Professor at the Department of Industrial Engineering at the State University of New York at Buffalo, has devoted much of her research to these sorts of questions. She led off the fifth session by giving a progress report on an experiment that provides electronic-mail services to elderly persons in their homes.

A primary goal of Czaja's study is to identify what difficulties elderly computer users encounter and what preferred uses they might have for computer systems. To investigate these issues, the project installed (for free) 40 simple computer systems in the homes of 40 elderly people. The systems had been developed by Bell Corp. for "techno-phobic executives" to use electronic mail (E-mail). Each system includes a small text editor; is always on; and has an automatic printout capability. Czaja and her staff provided plenty of technical support and offered 24-hour-a-day help service via a beeper system.

The ages of test participants ranged from 50 to 94 years old; the mean age was 68. The average number of years of education was 13.5, with a range of 10 to 18 years. Half of the participants lived alone; the other half lived with someone, usually a spouse. Twenty-eight percent of the participants had never worked at a job, 18% were currently employed, and 13% were employed parttime. Many participants had one or more physical disabilities: 26% reported hearing problems, 13% had limited finger dexterity, and 8% had vision problems (despite glasses). Although 21% reported some exposure to computers, none had any operational skills.

Volunteers reported a variety of motives for participating in the project: to help the nursing home through which the experiment was run; to join their friends in the experiment; to learn a potential way of communicating with their children and grandchildren; and to get a computer installed in their own homes. Because participants know they are part of a system design process, they are eager to provide detailed feedback.

Everyone joined the system with a friend, a social base from which new forms of interaction and socializing have arisen. When a newcomer joins the system, a message is sent to everyone, "Please welcome _____. She just joined the

system...." Participants now share their hobbies, interests, birthdays, poetry and recipes through the E-mail system. They consider themselves a group, and even held a party.

Training. The biggest single problem encountered by participants was the use of the "enter" key, primarily because its location was different from a standard typewriter. Some participants also found it confusing to find certain other keys -- the backspace key, "caps lock" key, etc. -- even though most caught onto the keyboard configuration quickly. Most of the participants found their learning experience fast, easy, simple and fun. All of them liked E-mail, and 97% would use computers in their homes.

Modifications to the system design. After the initial stage of the project, Czaja and her associates changed a few features to accommodate user requests and problems. The modified system had an auditory signal, like a bell, to let the user know that he had reached the end of the line of text (even though the system's "wordwrap" feature makes this unnecessary). Unused keys (including the caps lock key) were deactivated and painted over. Extra screen cues for certan functions were added. Finally, the new system was given a noisier printer, because many participants had asked for such a signal to alert them that a message was coming in. (Now many people consider the printer too noisy, especially at night. Solution: Turn off the printer at night.)

Problems of system operation. The most common problem encountered by participants was a jammed printer, which would require an on-site visit from the project's technicians. Sometimes a person's keyboard would lock up. Once the entire E-mail system crashed, causing many participants to worry that they had done something wrong or that their equipment was faulty.

When an electronic "bulletin board" was added to the system -- a popular feature that allows messages to be sent to everyone at once -- many participants forgot how to instruct the computer to send messages to individuals only. This problem reinforced Czaja's conviction that teaching the elderly how to use computers should proceed slowly and deliberately.

Usage patterns. On an average day (based on a random 13-day period early in the experiment), there are 34 "log-ons" among 30 people, a total of 32 messages sent, and an average of 3 messages sent per person per day. The mean number of words per message is 75 words; the average time to compose a message was 439 seconds (about seven minutes); and the number of users per day averages 15, with a range of 7 to 22. If no one sends a message in four days, the researchers contact that person to

see if everything is all right. (About two people in the group are not active users. One frequently reports malfunctions in the equipment -- seemingly a psychosomatic phenomenon.)

The content of messages varies immensely. One grandmother was trying to find a date for her grandson. Many messages talk about current events. Other messages talk about the project itself. Some participants developed on their own the innovation of using the E-mail as a text editor -- i.e., they send "messages" (letters or personal reminders) to themselves, which they then print out on their own printers.

Reasons for using E-mail. When the participants were queried about why they use the E-mail, 97% reported the desire to learn something new; 83% wanted a mental challenge; 76% wanted to socialize; 55% wanted to meet new people; and 48% wanted to do tasks. (Participants named these motivations from a list of options presented to them by Czaja.) Why do users prefer the E-mail over the telephone? Among the self-generated reasons given: It is easier to communicate with the E-mail, easier to expose one's deep feelings, and fascinating to use.

Likes and dislikes of the system. What did participants most like about the system? They said it is easy to operate; it allows them to communicate with others; it is interesting and stimulating to use; it helps one meet new people; it helps fight loneliness; it is great fun; and it can help one reach out in case of need.

Participants complained that the system broke down too frequently (24% cited problems with the printer) and that it was not challenging enough. Others complained that the system does not tell them if a message has gotten through, and that it is difficult to determine if the system has broken down.

Additional computer features desired. Having become familiar with the E-mail system, participants expressed desires for additional computer capabilities. The feature mentioned most often by participants (83%) was a personal data base which could store recipes, addresses, etc. Some 79% wanted a word-processing capability; 76% wanted community service information; 76% wanted the system in order to contact physicians; 76% wanted travel information; 72% wanted the system to help them balance their checkbooks; 72% wanted the system for continuing education; and 72% wanted it for news and weather information.

Czaja finds the preliminary results of her study promising. While elderly persons sometimes have trouble grasping new concepts like accessing a computer file and creating and storing a file, most of them have the characteristics of good learners. Old age can present special problems but often no

more so than other individual differences such as education levels or physical disabilities.

VI. VIDEOTAPE "VISITS" WITH INSTITUTIONALIZED INDIVIDUALS

Karen Warburton, Research Associate for the Greater Southeast Community Center for the Aging in Washington, D.C., led off the sixth session of the conference with a progress report on her experiments in using video to permit institutionalized individuals to "visit" with distant family and friends.

The Center manages two nursing homes and two adult day care centers in the Anacostia area of Washington, D.C., an area afflicted with great poverty, drugs and crime. Funding for residents' care comes primarily through Medicaid, so the nursing care does not typically include many luxuries.

Many families are unable to visit family members in the nursing home because of transportation problems, physical disabilities or personal aversion to visiting a nursing home. By inviting families to tape video messages for grandparents, parents and spouses who live in the Center's nursing homes, the project seeks to "give families another mode of communicating with their family members," said Warburton. The videos also seek to enhance the residents' morale and decrease their feelings of isolation and abandonment by making them feel more connected with their families.

The research hoped to answer a number of questions: Will the videotapes change the residents' relationships with their families? Will family members substitute videotapes for actual visits? Will confused or disoriented residents react in a different manner than other residents? How will elderly residents react when they see a family member on television?

The residents chosen for the experiment were those identified by the recreational therapy staff as needing some kind of outside contact, particularly from their families. To try to interest family members in the experiment, the Center sponsored a reception, which was poorly attended. Subsequent phone calls helped enlist 27 resident family groups to participate in the project, consisting of two or three family members for each group.

Of the 27 residents, 14 were men and 13 were women. Twenty-three were black, 3 were white and one was Hispanic. The age range of residents spanned from 47 to 95; the mean age was 76. The length of time that the residents had been in the nursing home ranged from 4 to 78 months, with a mean of 32

months. On the "mini-mental state" exam, scores of 24 are generally considered the minimum score for "normal"; people with lower scores are generally considered to have some sort of mental impairment. Of those residents able to be measured (some could not understand the questionnaire), half scored below 24 and half scored above 24. Residents' physical status varied greatly, with a wide range of scores on a scale measuring "activities of daily living" (dressing, bathing, continence, feeding, etc.).

To obtain some baseline measurements of the mental health of participating residents, Warburton and her associates assessed residents with three "morale" scales -- the Philadelphia Geriatric Morale Scale, Geriatric Depression Scale, and Bradburn Affect Balance Scale, as well as a mental status exam that measured attention, calculation and memory recall, among other factors. In addition, a speech therapist tested the hearing of each resident and an informal vision test was given. Functional abilities for daily living were also assessed. Finally, to identify any unusual emotional stresses in their lives at the time of the experiment (a death of a family member, a change of roommate, etc.), residents were queried with a special questionnaire.

Family members came to the nursing home to make their tapes, which lasted anywhere from three to thirty minutes. They chose the subjects they wanted to talk about, sometimes with the help of the Center's researchers. Most of the statements were spontaneously made and uninhibited; a few families prepared formal statements. Some family members recited basic facts about the resident's life, to prod his or her memory. Some quoted Bible verses; some made warm, "from the heart" declarations; others sang songs; still others carried on an ordinary chit-chat monologue ("What did you do today? How are you feeling?....").

Warburton said that many of the more personal sorts of communications to residents would not likely have occurred during normal face-to-face visits. Use of the video recording changed the nature of the encounter, and often encouraged family members to be more emotionally demonstrative, perhaps because it became less threatening to make intimate declarations of love.

Production quality for the videos was uneven. It was difficult to arrange proper lighting, and sound recordings were poor. But the sparse technical apparatus may have put families more at ease. In any case, the modest production qualities did not seem to be a major impediment to the project's goals, said Warburton.

Finances and nursing home rules did not permit each resident participating in the experiment to have unlimited access to a VCR and TV monitor. But residents were given an opportunity to watch the videos three times a week. Before and after viewing a tape, residents were asked to answer a questionnaire that asked about their mood and morale, and about their responses to the videotape. A researcher sat through the videotape screening with residents to observe their verbal and nonverbal responses.

The formal length of the experiment was one month, during which time the the frequency of visits by family members were monitored throughout the experiment. Over the course of the month, and for five months after the experiment, family visits to residents neither increased nor decreased.

At the end of one month, Warburton said that residents' morale had not changed much. Even though the videos were not influential enough to change residents' morale assessments, she believes that the videotapes probably had a positive impact on residents. "The residents love to watch the tapes over and over again, even though the material is often dated," said Warburton. Many residents were raptly attentive to the videos and interacted with them, responding to their family members' questions and statements.

"The tapes often acted as a catalyst in bringing out emotions that the residents had that they were not able to express to other people," said Warburton. She said that the recordings were therapeutic simply by getting families and residents to talk about their feelings. One resident, a double-amputee who had suffered a stroke, was greatly impressed with his television image, to the extent of bolstering his self-image. One non-communicative resident who responded only to his name was watching his sister on the videotape. When she asked him, "Where did you once live?" he suddenly blurted out the correct answer.

One unexpected result of the experiment was that nursing home staff was greatly affected by the tapes. By watching the tapes, they gained greater insight into the residents' family relationships, their interior lives and the kind of people they once had been.

Center researchers also developed a variation of the videotape "visits" -- a "video pals" project, which involved the exchange of video messages between residents at the Center's two nursing homes. Warburton said this experiment has been "almost more beneficial than the videos from the families, because residents are forced to take a more active role in expressing themselves." The project offered residents "a rare

opportunity to express themselves to someone not associated with the nursing home staff, who has nothing to do with their care." As a result of the "video pals" recordings, residents seem to have improved their personal hygiene and taken pains to look nice, said Warburton.

The experiment showed that videotape is "more than a medium of communication," said Alberta Jacoby, Assistant Professor of Public Health at Yale University. "It's a facilitator of interpersonal exchange and a shaper of identity." Jacoby suggested that volunteers, not just family members, should record videos for residents. Tora Bikson of the RAND Corporation believes that "the merits of asynchronous communication have not been fully investigated." Instead of viewing the video recordings "as a pale substitutes for real-time communication," she urged participants to explore the special dynamics of this novel form of communcation.

Eileen Connell asked Warburton what changes in the experiment she would institute "three steps ahead." Warburton replied that she would like to have a single staff person devoted to recording the videos and overseeing the project. She also would like residents to have their own VCR and television set so that they can have more control over when they watch their videos. But Tora Bikson warned that the risk of theft might make such an arrangement problematic.

Bruce Kushnick, President of National TeleVoice, said that there is a whole body of research that looks at therapeutic and instructional uses of videotape recordings. One experiment, for example, taped alcoholics as they sat drinking in bars. The images, when played back for the alcoholics, jolted 25% of them into stopping drinking, he said. Marriage counseling is another therapeutic milieu in which video recordings are used to help change people's self-images.

VII. EMPLOYMENT PROSPECTS FOR THE ELDERLY

Dr. H.R. Moody, Deputy Director of the Brookdale Center on Aging at Hunter College, opened the seventh session by giving his informed speculations about the employment prospects for the elderly in the 1990s and beyond.

Retirement is an issue that is plagued by many gross generalizations and stereotypes, said Moody, most of which are simply incorrect. One reason for so many stereotypes about retirement (such as that people grow morose after retiring, that Social Security is going to go bankrupt, etc.) is that "value presuppositions are interwoven with our factual beliefs about work and retirement." What people say about retirement

and what they do are often quite different, he said.

As a more reliable starting point for making projections about retirement, Moody urged that we not give too much credence to self-reported attitudes. We should focus instead on the structure of incentives (mostly economic) in large-scale organizations, and on cross-national retirement data, he said. This will yield a simple conclusion, Moody contended: "If you give people lots of economic benefits to retire -- as in Sweden, West Germany, etc. -- very few of them stay in the workplace. On the other hand, if you give limited benefits, people are less likely to retire."

What kinds of economic and cross-national data will provide insights into future employment trends for the elderly? Moody mentioned a few of the most illuminating factors: unemployment rates, sectoral labor shortages, the prevalence of parttime work, the disruptions of mergers and acquisitions, the vitality of small business as a generator of jobs, and above all, the centrality of "knowledge industries" in the economy.

The trend in recent decades to retire early, i.e., before age 65, is creating "a large class of economically unproductive people" which imposes additional costs on our society," said Moody. Some 38% of the federal budget is now going to aging programs, he said, and that amount is likely to increase substantially if current trends continue. As a result, Moody foresees a "cost crisis" afflicting the elderly in 20 or more years, when the finances of the Social Security system are strained by the retirement of the baby boom generation. In the meantime, policymakers have "a window of opportunity" in which to experiment with new economic incentives, employment programs and other policies that affect elderly persons. Unfortunately, said Moody, policymakers are not rushing to explore these options because there are no urgent crises impelling them to do so.

Moody pointed out that there is currently a major difference between men and women between the ages of 55 and 64 -- the years immediately preceding retirement. In general the men choose to retire while women choose to stay in the labor market. The explanation for this disparity is not clear, but Moody speculated that it may have something to do with the bleaker economic prospects that older women would face if they did not work. If the attitudes of the current generational cohort -- as shaped by its values, educational levels and unique historical events -- also play a role in this disparity, then future generations of elderly women may not choose to stay in the labor force.

Moody sketched four broad scenarios for the future of retirement: 1) The negative, in which older workers have trouble learning new skills and getting retrained; 2) The positive, in which personal computers and other electronic technologies could facilitate home work prospects; 3) The mixed, in which, as the labor market readjusts, some sectors boom while others decline; and 4) The qualitative, in which new technologies not only provide new work opportunities and flexibility but draw upon the work experience and wisdom of the elderly and compensate for their inherent work disadvantages (such as declining short-term memory and visual acuity).

Moody noted a paradox about the creation of future jobs for the elderly: Large companies have the resources to retrain large numbers of elderly people, but small companies generate many more jobs and offer a more congenial environment for the elderly. The most fruitful ways of finding employment opportunities for the elderly, said Moody, will probably involve programs targeted at small-scale, niche job markets rather than reforms aimed at macro-economic issues (such as changing the Social Security earnings cap). For example, Kelly Services, a temporary employment agency, anticipates making considerable money by placing older people in temporary jobs.

How much effort should be expended by government, business and social agencies to do make work options available to the elderly -- as opposed to non-work options? asked Christopher Makins of the Aspen Institute.

Bob Davidson, a broadcast consultant for the University of North Carolina, redirected the question by asking Moody if there are any studies of what affluent retirees actually do with their time. Moody replied that, in general, except for time during working hours, the activity patterns of retirees look very much like their still-employed peers. They are more likely to spend time with their spouse and other family members, watch television, go to church, and exercise. Their family identity seems to increase. He added that the rate of volunteerism does not go up with old age.

As far as the retirees' ability to work, Lydia Bronte, Visiting Fellow at the Phelps-Stokes Fund in New York, said that older people often deal more effectively with a wide range of customers and work circumstances, because of their age and experience.

There was a general consensus of the group that common misconceptions about the abilities of the elderly must be challenged. Only then will they be able to explore a broader range of options that suit their needs and preferences.

VIII. SUGGESTED INNOVATIONS IN NEW ELECTRONIC TECHNOLOGIES TO SERVE THE ELDERLY

The final session of the conference was devoted to exploring everyone's special hopes for how new electronic technologies would evolve to serve the elderly. What knowledge must be developed before certain projects can move forward? What broad social goals should be addressed?

Alberta Jacoby, Assistant Professor of Public Health at Yale University, exhorted participants to keep sight of the elderly's non-market needs -- for personal support, access to new work opportunities, and the opportunity to provide public service. These needs may or may not be consistent with the market goals of the emerging new electronic technologies, which makes it all the more important that these needs be kept foremost in mind, Jacoby said.

Kathleen Stutzman, Executive Director of Berks Community Television in Reading, Pennsylvania, urged participants to keep in mind the needs of "non-retirees" such as homemakers. People who have never worked also have distinct needs.

Bruce Kushnick of National TeleVoice was intrigued by the diversity of analytic instruments for assessing the needs of the elderly population. He thought it would be valuable to compile an inventory of those instruments and study which attributes are shared by the different instruments and which offer valuable types of market segmentation.

Dr. Marion Perlmutter, Professor of Research Scientist at the University of Michigan's Institute of Gerontology and Center for Human Growth and Development, said she was excited about the possibilities for greater inter-generational contacts via new technologies such as E-mail. The new Prodigy system would do well to exploit this notion, she said.

Joseph Sedlak, Director of Domestic Programs for Volunteers in Technical Assistance, believes that the new technologies should be exploited as a way to preserve the autonomy of older people and to care for them -- a need that grows more acute as the elderly's grown children play a lesser role in their parents' care.

The most important "service" that telecommunications can provide, said Tora Bikson of the RAND Corporation, is "easy, universal connectivity" among people. "We may not be able to have 'the extended family' but we can have 'the networked family,' whether through exchanges of videotapes, E-mail, voice

mail or other means," she said. To this end, Bikson urged technical standardization as a way to encourage integration of different media and greater "connectivity."

There are a number of organizations contributing to this mission, such as the Open Software Foundation and the companies trying to make UNIX a universal protocol, said Alan LaRue, Director of Elder Care Operations for Work/Family Elder Directions, Inc., of Watertown, Massachusetts. Representatives of these groups ought to be invited to future gatherings such as this one, he said.

Karen Warburton of the Greater Southeast Community Center for the Aging noted that institutionalized individuals have a great need for mutual support and communication. Computers and other electronic technologies might be able to help remove the stigma of participating in a therapeutic group, and facilitate greater interpersonal contacts.

Bruce Kushnick of National TeleVoice cautioned, however, that strangers do not like talking to strangers over "chat lines." If electronic technologies are going to succeed in the role Warburton envisions, the participants will need something in common. This observation was challenged by Sara Czaja, who noted that this was precisely the appeal of E-mail to the participants in her experiment -- communicating with strangers and discovering points of common interest. Different reactions to E-mail and chat lines may have a lot to do with the psychological differences of audio and electronic-print communication, interjected Susan Walters of Pacific Telephone.

"What policy actions are needed to translate some of these ideas into reality?" asked Christopher Makins of the Aspen Institute.

There is only a limited amount of "protocol conversion" that can be done by the regional Bell operating companies (RBOCs), under AT&T divestiture rules, said Susan Walters of Pacific Bell. The availability of more "gateway services" that translate the protocols of different operating systems would do a great deal to diffuse new technologies, she noted.

Walters lamented the difficulty that various interested parties have in learning about the other's work. For example, business may have trouble learning about the research going on at universities; university researchers may not know about the latest technological developments in business and government; consumers may not be invited to participate in the design and development process for new technologies, which can result in less-than-optimum design choices. These barriers need to be broken down, she urged. Other participants agreed: A cross-

disciplinary dialogue which ought to occur, is not occurring, impeded in part by basic differences in each sector's "culture."

H.R. Moody took issue that the barriers to communication were a matter of culture. "I resist cultural explanations, because I believe if we go down that route, we will conclude that nothing can be done until the culture changes. I would prefer to focus on the actual incentives," he said. "How can Prodigy get together with gerontologists for something that's in both their interests -- in which case something will happen, culture be damned."

One way to forge new bonds between different factions is to focus on technological changes that can help the general population as well as smaller populations like the elderly, suggested Joseph Sedlak of Volunteers in Technical Assistance. One good example of this, he said, was the battle for disabled-access to buildings, an innovation that many non-disabled people also find convenient. Sedlak's prescription: Create new partnerships based around the self-interests of each of the partners. Business need not be philanthropic to serve the elderly; it can do so by identifying and exploiting untapped markets.

But what can foundations do while waiting for those market forces to materialize? Bikson said that business needs to take greater risks to show that certain unorthodox applications of new technologies are feasible and potentially profitable -- as many of the Markle Foundation projects do. She also urged greater attention to the targeted dissemination of research results to policymakers and practitioners outside of academia. The Markle-sponsored Yankelovich survey on the elderly is one good example of this approach, Bikson said.

Alan LaRue, Director of Elder Care Operations at Work/Family Elder Directions, issued a cautionary note: "Don't be taken in by the glitz of new products. Prodigy is not a panacea; it is only part of the solution to the elderly's needs....New electronic technologies are most valuable when they are part of a broader networking capacity that actively involves people and draws upon their creativity." Kathleen Stutzman of Berks Community Television elaborated on this theme, warning that the technology should be kept in the hands of users, the people have to run the system, and not be monopolized by the "tekkies."

Bruce Kushnick of National TeleVoice urged that there be more research on how people use -- and would be willing to use -- their phones. H.R. Moody suggested that someone should convene a meeting of audiotex experts and gerontologists

(perhaps at the Gerontological Society or National Council on Aging) to explore the possibilities for the medium, especially for the homebound.

At any future conferences of this sort, Kushnick suggested that there be representatives from the government and large companies that are bringing new technologies to market. Joseph Sedlak suggested that any future gatherings include members of the international community. And Karen Warburton suggested inviting some elderly people themselves, so participants can hear their fresh, firsthand perspectives.

To draw together the discrete insights into technology-specific projects, Tora Bikson urged that future researchers try to synthesize the separate strands of knowledge into "a generic conceptual framework" for understanding intermedia communication. When is asynchronous interaction more appropriate than synchronous interaction? When are visual cues valuable, and when are audio cues preferable? When are different media synergistic and compatible with each other, and when are they not?

It is not entirely surprising that this diverse group exploring a topic on the frontiers of current knowledge did not emerge from the conference with clear conclusions about the future. The discussions did, however, illuminate some of the issues that must be dealt with if new electronic technologies are to be successfully designed, marketed and effectively used by elderly Americans.

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