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**THE INSTITUTE FOR
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ANNUAL REPORT

STANFORD UNIVERSITY

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DECEMBER 1979

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INTERNATIONAL COMMUNICATION

The Institute includes a graduate training and research program in the field of international communication as one of its major activities. Faculty involved in the international communication program include Everett Rogers, Lyle Nelson, Edwin Parker, Bella Mody, Dennis Foote, and Barbara Searle.

In 1979, the graduate training program continued in its sixth of seven years with primary funding from the U.S. Agency for International Development. About twenty-three M.A. students are enrolled in a program in communication and development, and approximately twelve Ph.D. students pursue doctoral programs specializing in communication and development. Seven of these 35 students were supported, at least in part, by the USAID grant, and the remainder received fellowships from their national governments, home universities, or private foundations.

Everett Rogers taught part-time in the Department of Communication at Iberoamericana University, Mexico City, during winter, 1979, while on a sabbatical leave from Stanford University. Rogers also completed the manuscript for a book, *COMMUNICATION NETWORKS: A NEW PARADIGM FOR RESEARCH*, to be published by Free Press in 1980. Co-authored with D. Lawrence Kincaid of the East-West Communication Institute in Honolulu, this book argues for investigating network links between two or more individuals as the basic unit of analysis in communication research. Rogers and Kincaid describe and compare different methods of network analysis as means of identifying the communication structure of a system. Certain of the illustrations utilized in this book are taken from recent research by Rogers and Kincaid on diffusion networks for family planning innovations in Korean villages.

Rogers will assume his duties as President of the International Communication Association in May of 1980, at the annual ICA convention to be held in Acapulco. As President-Elect in the past year, Rogers has been program chairperson responsible for organizing the Acapulco conference, which features 31 workshops, and about 700 papers in 175 different sessions. About 2,500 participants are expected, making this ICA conference the largest gathering of communication scholars held to date.

COMMUNICATION TECHNOLOGY TRANSFER

UNESCO has sponsored two Institute research projects on communication technology transfer. Everett Rogers is collaborating with Professor

John K. Mayo of Florida State University in an investigation of the transfer of the children's television program, "Sesame Street," by the children's Television Workshop of New York, to Mexico City, where a Latin American version of the program was produced and distributed by TELEVISA, the Mexican television company. Rogers and Mayo collaborated with Dr. Fernando Morett of TELEVISA in conducting their personal interviews with U.S. and Mexican officials. A research report from this study is now being completed.

The second UNESCO-sponsored research, being conducted by Ronny Adhikarya for his doctoral dissertation, investigates the transfer of U.S. communication theories and research methods to schools of communication in the five ASEAN nations. His research is also partially sponsored by the East-West Communication Institute.

Everett Rogers was invited by the UNDP, UNFPA, and the Government of Jordan to spend a week in Amman in consultations about the role of communication in development in April, 1979. A relevant Jordanian official then participated in the Summer Workshop on Message Design at Stanford University. Rogers has now been asked to author a brief report on how the Jordanian government might initiate a Center for Development Communication.

While living in Mexico City in winter of 1979 on sabbatical leave from Stanford University, Rogers provided consultation to various Mexican institutions: Universidad Iberoamericana, INIA (Instituto Nacional de Investigaciones Agricolas), CONAPO (Consejo Nacional de Poblacion), and TELEVISA.

Rogers and Rahul Sood, a doctoral student at Stanford University, traveled to Dominica in August, 1979, to investigate mass media coverage of Hurricane David. Their work was supported by a small grant from the National Science Foundation. Rogers continues as Chairman of the Committee on Mass Media and Disasters of the National Academy of Sciences.

Bella Mody participated in the USAID/Academy for Educational Development Seminar on Communication and Rural Development in North Yemen in December, 1978.

Professors Rogers and Mody were invited by the National University of Costa Rica to advise its Institute for the Study of Social Problems in Population (IDESPO) in setting up a new communications activity. Professor Mody went to Costa Rica in November, 1978, and met with the faculty at IDESPO. To ensure integration of their new activity with related agencies, IDESPO arranged meetings with the staff at the government radio and TV stations, the Ministry of Health's health-education unit, the Costa Rican Demographic Association, the Social Security Administration (Health Care), the Family Resources (Nutrition) Institute, the Social Assistance (Job Training) Institute, the National Patronage of Infancy (Legal Aid), the Children's Hospital,

the Center for Family Orientation (COF), and the Latin American Centre for Communication and Family Planning (CIACOP).

As a result of this trip, Bella Mody and Olga Acuna of IDESPO have proposed a collaborative research project that aims at assessing the communication needs of women-headed households in one of the poorest provinces in Costa Rica. Two Costa Rican professionals attended the Summer Workshop on Development Communication Message Design: Maria Carillo of IDESPO and Carlos Pena of COF.

Bella Mody and Everett Rogers collaborated in the preparation of a paper on "Women's Networks and Development Planning" that was presented by Mody at a special panel on Women in Development at the Annual Convention of the International Studies Association in Toronto, Canada in March, 1979. Professor Mody also shared the ideas in this paper and the basics of the proposal to study women-headed households with a selected group of USAID officials in Washington, drawn from the Latin America Bureau and the Women in Development group.

Bella Mody was invited to participate in an East-West Communication Institute seminar in June, 1979, a Communication Planning Research Review that involved analysis of draft case studies prepared by six East-West Center investigators.

Bella Mody participated in the USAID Academy for Educational Development conference on the uses of radio to support agricultural development to Jamaica in June, 1979. Mody helped to draw up the scope of work and the nature of radio support for the Integrated Rural Development project in Mandeville, Jamaica.

Mody participated in a USAID Policy and Training Project-organized Faculty Workshop in Washington in July, 1979.

Mody directed and taught at the USAID-supported Stanford Summer Workshop on Development Communication Message Design in August, 1979. Twenty-nine participants from 21 countries traveled to Stanford to study systematic approaches to message design for development support. Also involved in this workshop as teachers were Douglas Solomon and Everett Rogers.

Janet Alexander attended the Nutrition Education Campaign Seminar in Ocho Rios, Jamaica, in September, 1978. Alexander participated as one of a panel of international consultants assisting Jamaican health professionals in planning the next phase of the national nutrition education campaign. Forty-seven representatives of the health/nutrition teams in each of the four health zones of Jamaica attended. Prior to the seminar, the campaign had mainly focused on events through the mass media. The objective of the seminar was to focus attention on how best to develop the involvement of the community-based health workers in relation to the media campaign and the overall nutrition education program. By the end of the week-long seminar, Jamaican participants

from each zone had developed an action plan and a set of recommendations to the national campaign directorate for future national and local initiatives to further the overall campaign.

MASS MEDIA AND NUTRITION IN DEVELOPING COUNTRIES

In fall of 1978, Stanford received a five-year contract from the Development Support Bureau of the U.S. Agency for International Development (AID) to evaluate two experimental projects for mass media and nutrition in two developing countries. The projects will be conducted under a separate contract by the Academy for Educational Development in Washington, D.C. They will be designed to test ways of maximizing the impact of mass media-based campaigns in developing countries. The specific intervention chosen for the experiments is the education of a rural population about the prevention and treatment of infant diarrhea, which is a major contributor to infant mortality in developing countries. The experimental treatment will be the use of radio messages in conjunction with printed materials such as photo-novels and educational and clinical activities by the rural health care system. The Institute is responsible for assisting in the design of the experimental treatment and for their evaluation.

Honduras has been chosen as the country site for the first intervention which will run for two years, beginning in 1980. The second intervention, which will run for one year, will take place in a country to be selected in early 1980. Field offices will be established in both countries, and data will be collected through interviews, survey questionnaires, clinical records, ethnographic analysis, and other means.

Current project team members include Dennis Foote, Everett Rogers, Barbara Searle, and Nalini Mishra. Also involved as consultants are Dr. Reynaldo Martorell of Stanford's Institute for Food Research and Mark Rasmuson of the East-West Center in Honolulu. Dr. Carl Kendall will be posted to the field office in Honduras early in 1980.

COMMUNICATION TECHNOLOGY AND DEVELOPMENT

Work proceeded during 1979 on a three-year research and training project in Communication Technology and Development. Begun in 1977 with major financial assistance from the Agency for International Development, the project's major goal is to analyze AID policies and U.S. training opportunities in the area of planning and utilization of communication technology for development. Because of the policy and training focus, it has become known as the AIDPAT project.

During the course of the project, seven faculty and twelve staff of the Institute have participated in various phases of the research and training. Project team members the first year included professors Edwin Parker, Everett Rogers, Robert Hornik, Emile McAnany, and Dennis Foote;

research associates included Barbara Searle, Peter Spain, Jeanne Moulton, Jeremiah O'Sullivan, Frans Lenglet, and Douglas Solomon, and research assistants Eduardo Contreras-Budge, Andy Hardy, Douglas Goldschmidt, Ronald Rice, and Ronny Adhikarya.

Three major reports by Peter Spain and Jeanne Moulton were produced under the training part of the contract in the first year. The first was a descriptive inventory of all U.S. universities and selected other U.S. and foreign institutions offering post-graduate or mid-career level training in development communication excluding print journalism. The second was a detailed analysis of the fifteen U.S. institutions with the most relevant programs. The third was an analysis of policy alternatives for AID's support of communication training.

On the policy research and analysis side, six major in-house reports resulted from the first year's efforts. The research staff was organized into five development sector teams: agriculture, education, health, nutrition, and population. Each team produced a report on the past role and future potential for use of communication for development tasks within each of the five sectors of interest to AID. The policy research that led to these papers included detailed review of prior AID projects and policies, including the sectoral development policies to be supported by communication projects or components. Evidence of development problems and benefits was reviewed, future potential analyzed, and recommendations made for changes in AID policies. The process was a highly interactive one involving many meetings with AID personnel. A Washington project office was maintained during the first year.

The major second year tasks included preparation of field guides to help AID mission officers develop improved communication projects and project components, an updated policy document, an analysis of the role of telecommunication infrastructure in rural development, and other special topic papers. Parker, Foote, Mody, Searle, Lenglet and Rice played key roles in the second year project activity.

As part of the AIDPAT project activity, Parker and Foote participated in developing AID plans for a communication satellite technical assistance program that was formally announced by the U.S. government at the UNESCO General Assembly in Paris, November 1978. The new AID program will provide technical assistance and financial support to developing countries wishing to use small ground stations in rural areas to communicate through Intelsat satellites. The program will demonstrate new lower cost technologies for rural communication as well as support pilot applications projects making use of the new technology.

Also, as part of second year activities, a three-week Message Design Workshop was held at Stanford during the summer of 1979. Directed by Professor Mody, the workshop involved 29 participants from 21 developing countries. Everett Rogers, Douglas Solomon, and Mody taught the workshop. All participants rated the experience a

valuable and useful one and recommended the continuation of such activity through a series of regional workshops to be held in different parts of the world. An evaluation report on the workshop has been published and is available from the Institute.

Based upon the success of the Stanford Message Design Workshop, and as provided for in the project work statement, a contract was entered into with Cornell University to conduct a three-week short course in Communication Planning and Strategy during the summer of 1980. Professor R. D. Cole will be in charge of the course which will be organized and offered by the Department of Communication Arts in New York State College of Agriculture and Life Sciences.

Other activities during the year included: completion of drafts of the four field guides; completion of a first draft of a special topic paper (by Al Neill of Kaiser International with the assistance of Professor Nicholas Imparato of the School of Business at the University of San Francisco) on the organization and management of communication projects in developing countries support of the second year of Ph.D. study in communication and education at Florida State University of Dibya Man Karmacharya from Nepal; publication of a Ph.D. dissertation, supported in part by the AIDPAT contract, on "The Role of the Telephone in Economic Development" (Andrew Hardy); and distribution of more than 500 copies of the health, nutrition, education and overview policy papers along with papers on training policy and institutions.

In October, Professor Lyle Nelson replaced Parker, who is on a two-year leave of absence, as principal investigator for the project. Barbara Searle remained with the project as administrative coordinator.

TRAINING WORKSHOPS

The United States Agency for International Development Policy and Training Project (AIDPAT) contracted with the Institute for Communication Research at Stanford University to organize the first of its three United States based short training workshops in development communication for mid-career professionals from Third World countries. Directed by Bella Mody, Everett Rogers, and Douglas Solomon, the workshop was conducted at Stanford from August 14 to September 1, 1979.

Twenty-nine participants from twenty countries attended. Eighteen participants were supported by U.S. government agencies, three were supported by their own governments, six were supported by United Nations organizations, and two were supported by personal funds.

Eight participants came from Latin America, nine from Africa, five from the Caribbean, three from South Asia, three from the Middle East, and one from the New York headquarters of a United Nations agency. Twenty-four were nationals of the Third World countries they worked in, and five were expatriate specialists.

The purpose of the workshop was to provide Third World development-communication TV producers, radio producers, graphic artists, extension agents, and educators with exposure to a range of low-cost, do-it-yourself research methods for the systematic design of materials in support of agriculture, animal husbandry, health, nutrition, family planning and non-formal education. The main focus was on formative evaluation.

The following suggestions from the Course Evaluation were repeated by a large number of participants: teach formative evaluation methods in the field rather than in a U.S. classroom, invite Third World formative evaluators to present Third World case studies, have a unified approach to formative evaluation shared by all faculty, have formal sessions in the mornings and group activities in the afternoons, pay travel expenses to visiting faculty so the scheduling of their presentations is determined by the course content and not by their convenience, do not accept participants who cannot follow the medium of instruction since they slacken the momentum for the rest, design the course according to the participants' backgrounds and expectations, design the course for more homogeneous groups sharing use of a particular medium or a particular development area (e.g., animal husbandry), and design courses at national and/or regional levels in collaboration with Third World faculty so a transfer of skills takes place at both faculty and practitioner levels.

As a result of the workshop, UNESCO, UNICEF, and FAO in addition to several regional organization have contacted the organizers to help conduct regional and national workshops.

THE ROLE OF THE TELEPHONE IN ECONOMIC DEVELOPMENT

This study by Andrew Hardy for his dissertation was concerned with the role which telecommunications and more specifically, the telephone, play in economic development. Intuitively, the telephone can be seen as a facilitator of economic development. This study sought to empirically demonstrate that the telephone does facilitate economic development, to quantify the degree of facilitation which occurs, and to explore how it facilitates economic development through communication processes. It was hypothesized that communication media, as channels of information, increase the potential for information flow in business enterprise and the variability of communication structures which can exist. The telephone as a two-way interpersonal medium was hypothesized to create greater potential for information flow in business and greater variability in potential communication structure than one-way mass media.

Indicators of economic development, the telephone, and mass media were used in a pooled, cross-sectional time-series regression analysis. The case was the nation-year. The above indicators were used as measures for each nation-year. Data for 61 developing and 15 developed

nations for the years 1960 through 1973 constituted the major body of data for analysis. Using cross-sections of these nations over time, the relationships between these indicators in time was examined through multiple regression and path analysis.

It was concluded that the telephone does facilitate economic development. This facilitation seems partially due to the telephone's potential for supporting a variety of communication structures. It may not facilitate economic development through business communication to the extent expected. Evidence of facilitation through non-business communication over the telephone was found.

HEALTH COMMUNICATION

The Stanford Heart Disease Prevention Program (SHDPP), directed by Dr. John W. Farquhar with Nathan Maccoby as co-director of community studies, is a multidisciplinary comprehensive research activity aimed at discovering principles of disease prevention (see 1978 Annual Report). Since the prevention of cardiovascular disease and several other diseases depend heavily on people's lifestyles, changing ways in which people behave is essential for reduction of the incidence of these diseases. Since communication can play an enormously important role in helping people to achieve the necessary changes in their lifestyles, the Institute for Communication Research has been heavily involved along with the School of Medicine and the School of Education in a multi-project research program which has been conducted over the past eight years.

The Stanford Community Health Project is a major component of the SHDPP. Its purpose is to develop and test health education programs that will prevent premature death and disability from cardiovascular disease. Coronary heart disease, which kills some 245,000 Americans annually before they reach retirement age, is largely preventable. The primary prevention of cardiovascular disease requires a comprehensive approach that combines an educational program for the general public with the continued efforts of the medical community. By teaming up with the communities, the Stanford group will carry out a program of health education to reduce the prevailing levels of serum cholesterol, weight, blood pressure and cigarette smoking, and to promote physical fitness.

THE THREE COMMUNITY STUDY

The first major project of the community studies part of the SHDPP was the Three Community Study, which has been described in considerable

detail in previous Annual Reports and is summarized briefly below. In this earlier project, three small communities were selected for study. In two of them, mass media programs were devised, prepared, and launched. In one of these two communities, the mass media program was supplemented by an intensive face-to-face instructional program among a sub-sample of people at the highest risk. The third community was retained as a control. After two years of community education, results indicated that substantial reductions in risk of cardiovascular disease took place. The risk was measured by means of an adaptation of the Framingham multiple logistic of risk developed by Cannoll, Kornfield and Truitt. This measure has as components systolic blood pressure, blood cholesterol, presence or absence of abnormal electrocardiogram and other factors. The fact that substantial reductions did take place and were maintained over a two-year period points the way to larger-scale, generally applicable community education programs that could be successful in reducing risk of not only cardiovascular disease, but cancer, abnormal pregnancies, and other disorders.

Two communities (Gilroy and Watsonville) were selected for public health education, with a third (Tracy) serving as a control. A random sample of the citizens between the ages of 35 and 59 were asked to complete interview and medical tests in all three communities. Surveys revealed the degree of their knowledge about heart disease, and the degree to which their behavior and lifestyles affected their risk of heart attack. The medical estimates included measurements of serum cholesterol, triglyceride, weight and blood pressure.

After the initial survey, educational campaigns via mass media were started in Watsonville and Gilroy. Specifically, the messages advocated dietary change (a reduction of animal fats, cholesterol, sugar and salt, and an increase in fiber), giving up cigarettes, a return to ideal weight, and a program of regular exercise.

With the cooperation of local broadcasting and newspaper outlets, messages were delivered through a variety of media. There were some fifty TV spots, three hours of television, over one hundred radio spots, many hours of radio programming, weekly newspaper columns, newspaper articles and advertisements, and direct mail. Media materials were prepared in both English and Spanish. The Spanish materials were not always a direct translation of the English, but took into account cultural and dietary differences.

In Watsonville, a random sub-sample of those at high risk were selected to receive an additional 14-week program of "intensive instruction" in addition to the community-wide campaign. They received home counseling or took part in group classes led by Stanford physicians, health educators and graduate students trained in health education.

Surveys and medical examinations were undertaken after one, two and three years of the campaign. As might be expected, those receiving

intensive instruction in addition to the media campaign showed the sharpest initial reduction in risk. But two years later, those receiving health messages through the media only had caught up with the sub-sample of high risk persons who were receiving intensive instruction. When overall risk of heart disease was calculated, Gilroy and Watsonville participants showed reductions of between 16% and 18% after two years. In Tracy, which received no education campaign, the average risk had increased by 6.5%.

These results were gratifying and have been receiving worldwide attention. The Three Community Study demonstrated that a mass media program can substantially reduce the risk of heart disease -- even more so when the mass media program is complemented by face-to-face instruction.

THE FIVE CITY PROJECT

The Five City Project currently underway in Salinas, Monterey, and three comparison communities is based on prior work in the Three Community Study. It is funded by the National Heart, Lung, and Blood Institute. It incorporates the successful elements of the previous study, but will be broader and deeper in scope in many respects:

1. The two communities selected are much larger and more complex than those in the previous study, and the health education campaign is aimed at benefitting the entire populations, rather than just a sample.
2. The projects will run for 5-8 years, and the community health efforts will be encouraged to continue indefinitely.
3. A much larger number of citizens, ranging in age from 12 to 70, will be asked to take part in surveys and medical check-ups.
4. With the cooperation of local health officials, the Stanford group will keep track of the annual incidence of heart disease in the communities and observe changes.
5. Most important, the Stanford group will work with community organizations to promote truly community based programs for group education, on a cost-effective basis that can be reproduced elsewhere.

Over the next five to eight years, residents of Salinas and Monterey will be encouraged to take steps to control blood cholesterol, control blood pressure, quit smoking, control weight, get more exercise, and find ways to reduce or control stress. They will be offered step-by-step advice that will enable them to make gradual lifestyle changes. Indeed, the aim of the program will be to help people add to

their feeling of well-being and zest for living, while at the same time they reduce their risk of heart disease, strokes and certain types of cancer.

The program will be strictly voluntary. Its aim is to produce a social climate which encourages people to consider making healthful changes in lifestyle and to provide the information that will enable them to make sound, informed choices.

WILL IT WORK?

The Salinas/Monterey program will be aimed at the entire population. Its effectiveness will be measured in two main ways. One indicator of success will be the expected reduction in cardiovascular disease reported over a period of time. Also, interviews with a random sample of the population before and during the educational program will track the changes residents are making: changes in knowledge, attitude, behavior, and actual heart disease risk. The first sample was invited to survey centers in the fall of 1979 and the first months of 1980. Medical tests included measurement of blood lipids, weight, blood pressure, heart rate, and so on. Questionnaires gathered information on eating and living habits, knowledge about the causes of heart disease, and attitudes towards health.

Some survey participants will be invited back to the survey centers in later years, so that change can be measured in individuals. Additionally, other residents will be invited to participate in the later surveys to obtain indications of change in the population at large.

THE EDUCATIONAL PROGRAM

The educational program will have two broad aims.

1. To create a climate of opinion which encourages people to think positively about their health.
2. To provide step-by-step advice that will help people make specific changes in food and lifestyle.

There will be four main channels of education: the media, adult education groups and classes, youth groups in schools and other classes, and professional groups and organizations. While there will be a steady background flow of information about healthful living in general, carefully coordinated "waves" of educational effort will focus attention on each major risk factor in turn.

The educational program is being coordinated by Janet Alexander

and includes Prudence Breitrose, Elizabeth Adler, Edwenna Werner, Elizabeth Blackmer, Douglas Solomon, June Flora, and Phillip Næder.

MEDIA CAMPAIGN

The media campaign will employ programs and spots on TV and radio in addition to newspaper columns which will appear in English and Spanish. Television programs such as the "Heart Health Test," launched the campaign on KSBW-TV in Salinas; related television spots will appear on several cooperating channels. Radio programs in Spanish will be heard on KCTY Radio and radio spots in Spanish and English will be played on several other local radio stations. Dr. Farquhar will give specific advice for gradual change in a weekly newspaper column. In addition, Spanish newspaper columns will appear in EL SOL. Books and booklets are being prepared in Spanish and English; some are being given away free while others will be available at a nominal cost. Posters, point-of-sale displays, and information centers will also be available. The media campaign is directed by Janet Alexander.

ADULT GROUPS AND CLASSES

Members of the Stanford Heart Disease Prevention Program are working closely with local groups, providing training for group leaders and educational materials for use in classes. The classes will be offered through churches, civic groups, junior colleges, and so on.

YOUTH

With the cooperation of the local schools, special programs are being offered in the schools. Initially, a major emphasis is on smoking prevention. Teenagers (in particular, teenage girls) are showing alarming increases in the rate of smoking on the national scene. Later, programs will focus on smoking cessation for high school students, and on nutrition, exercise and weight control for elementary schools. The youth program will parallel the adult education campaign, which will make it easier for entire families to adopt healthier lifestyles together. Cheryl Perry, Michael Telch, Joel Killen, and Nathan Maccoby are working on this project as part of joint Harvard (McAlister)-Stanford NICHD-sponsored research.

PHYSICIANS AND HEALTH PROFESSIONALS

The role of doctors and other professionals is one of the most important in health education. The Stanford group will work closely with local health professionals through seminars, newsletters, and workshops to provide useful programs for health professional use.

POST-DOCTORAL TRAINING

Another project that is under the auspices of the SHDPP is a post-doctoral training program which was referred to in the last Annual Report. This training grant is designed to take a small number of Ph.D.'s and M.D.'s and provide them with training in cardiovascular disease prevention research. These trainees participate in all the varied activities of SHDPP, most especially in doing what are referred to as prefield experiments. Maccoby is one of the principals of this project, and several Ph.D.s in communication have been post-doctoral trainees. In these prefield experiments studies are made comparing the relative effectiveness of various methods of helping people to change their habits with respect to disease contributing factors such as smoking, eating the wrong foods, obesity or lack of exercise. The results of these prefield experiments are then put to work in the largescale community projects that Institute staff members participate in.

EDUCATIONAL STRATEGIES FOR THE PREVENTION OF ALCOHOL ABUSE

This report by John Hochheimer was commissioned by the Panel on Alternative Policies Affecting the Prevention of Alcohol Abuse and Alcoholism of the National Research Council. It was presented to the September meeting of the Panel in Washington, D.C. The report examined the implementation of past alcohol abuse moderation campaigns. The factors which led to the apparent failure of these campaigns were identified, as well as the factors that were utilized in more successful public health education interventions. Recommendation for future alcohol abuse education programs were discussed.

Maccoby has served as a member of the Panel on Corporate Social Responsibility of the American Council of Life Insurance. He has also been serving on the Panel on Alternative Policies Affecting the Prevention of Alcohol Abuse and Alcoholism of the National Research Council. He is a member of the newly established Academy of Behavioral Medicine and has served as a member of the study section on Behavioral Medicine of NIH. He gave a paper at the first meeting of the Academy of Behavioral Medicine in San Francisco in September.

COMMUNICATION AND CHILDREN

Work on children's reactions to television commercials, to informational public service announcements, and to persuasive messages in general has continued under the direction of Donald Roberts.

Studies looking at children's comprehension of learning from animated public service announcements were completed during the year. The spots, produced by ABC television for Saturday morning broadcast, deal with a variety of health and safety issues (e.g., avoiding junk foods, bicycle safety, dangers of approaching strange animals). In a study of children's comprehension of these spots, children of ages four through five and seven through nine viewed videotapes of eight spots. After each spot, the tape was stopped and the child was interviewed regarding his or her understanding of the various dimensions of the spots. Content analyses of the children's responses to the open-ended interviews revealed almost total comprehension by the older children of the central point of each of the spots. Moreover, the proportion of older children who comprehended the narrative elements of the spots and/or the motives or events underlying the actions of the spots seldom fell below 50 percent. Preschool children understood somewhat less. Nevertheless, in most instances more than 50 percent of the four and five year-olds manifested awareness of the main point of each spot. The study also found evidence that younger children were more likely to understand the elements of a spot if they were familiar with the topic; all children gave more evidence of comprehension of elements of spots characterized by action as opposed to those characterized by verbal delivery of instructions or warnings -- a possible indicator of attentional differences mediated by portrayed action. The results of this study are detailed in "Children's Comprehension of Animated Health and Safety Public Service Announcements: An Evaluation" by Donald Roberts and Wendy Gibson.

A second study used the same public service announcements to determine the extent to which children learned specific information from or had their responses influenced by viewing the spots (see "The Impact of Animated Public Service Announcements on Children's Responses to Questions about Health and Safety" by Donald Roberts, Wendy Gibson, and Christine Bachen). In this study, four of the public service announcements were imbedded in one version of a television program, and four others in another version. Groups of younger children (ages four through six) and older children (ages seven through nine) viewed one of the two "shows" under the impression that we were interested in what they thought of the show. Subsequent to viewing they were interviewed about the eight issues covered by the spots, four of which the children had seen and four of which they had not. Hence, each child served both as a treatment subject and a control, depending on which spot was being asked about.

Results showed a clear-cut effect for treatment. Children who had seen a spot dealing with a particular issues (e.g., safe bicycling rules) were more able to give "correct" and/or acceptable responses to questions dealing with that issue (e.g., "Can you tell me some things that are dangerous for children to do when they ride bicycles?") than were children who had not seen the spot. Not surprisingly, there was also a consistent effect for age; older children recalled more from the spots than their younger counterparts. Contrary to initial expectations, there were no differences in responses attributable to sex of the viewer and/or sex of the protagonist in the spots.

Peter Christenson completed a Ph.D. dissertation as part of this general program of research. His study asked whether it is possible to develop "consumer information processing messages" that would function to mediate children's responses to television commercials as a class of messages. He developed such a consumer information processing message (CIP) and embedded it in a television program along with three test commercials (for a game, a gum, and a sweetened cereal). A second version of the program contained the commercials but not the CIP spot. A control version contained neither commercials nor the CIP spot. First and second grade children and fifth and sixth grade children then viewed one of the three programs after which they responded to a variety of items designed to assess their rankings of and desire for the three items. Christenson found a slight but not significant tendency for children who viewed the CIP message to rank the advertised products lower, and a statistically significant tendency for those children to be more critical in their ratings of various dimensions of the products.

The results of this study as they relate to the two food products, as well as the results of children's comprehension of and response to the animated spot produced by ABC to warn children to avoid junk food, and the results of a study noted last year ("The Impact of Within-Ad Disclosures vs. Supplemental Nutrition Messages on Children's Understanding of the Concept of a 'Balanced Breakfast'" by C. Bachen and D. Roberts) were all summarized in a paper delivered at the Annual Meeting of the American Psychological Association in New York City (1979), "Children's Responses to Consumer Information and Nutrition Information Television Spots" by Roberts, Bachen, and Christenson.

Work in the general area of children and persuasion is continuing. Roberts, Bachen, and Christenson have been attempting to develop a model of children's persuasive information processing. Their approach assumes that the ability to recognize and deal with persuasive messages as opposed to "informational" or "educational" messages depends on the child's level of cognitive development, amount and nature of experience, and so forth. They hope to trace the ontogeny of this development.

Roberts and his colleagues are also continuing to investigate other dimensions of children's uses of and responses to the mass media. Data on the amount and kind of media use, family structure, children's degree of integration with peers and family, beliefs in the utility of information derived from television drama, levels of information about current events, and so forth have been collected from all children in one heterogeneous school district. In addition, the children in this study provided a day-by-day television log for a full week. Initial analyses of these data are under way.

Finally, a new program of research on television and children is about to be developed. Roberts, in conjunction with Gavriel Salomon of the Hebrew University of Jerusalem, has received funding from the Markle Foundation to study the relationship between television viewing and reading. This research is in the initial planning stages.

With support from the Boystown Center at Stanford, Everett Rogers and Sharon Strover co-authored a paper entitled, "Peer Communication and Sexuality," which will appear in the book CHILDHOOD SEXUAL LEARNING: THE UNWRITTEN CURRICULUM, to be published by the Ballinger Press in 1980.

WOMEN AND SEX ROLES

William Paisley, Christine Bachen, and Mary Hadley conducted the Stanford replication of a study of undergraduate career plans that was first conducted at Cornell University by Jennie Farley. A stratified sample of 250 Stanford undergraduates completed a questionnaire that dealt with their career plans, salary expectations, values, and family background variables. Two findings were striking: (1) approximately equal proportions of undergraduate women and men are preparing for careers in business and the professions (slightly higher proportions of men preparing for business careers were balanced by higher proportions of women preparing for careers in medicine and law); (2) however, within most categories of career choice, women projected significantly lower salaries for themselves, ten years in the future. This difference in projected salary persisted in statistical analyses controlling for family background.

Matilda Butler and William Paisley conducted a three-part study of the "career coordination strategies" of professional couples, most of whom were members of the American Psychological Association. In the first substudy, 45 case histories prepared by professional couples themselves were analyzed in terms of four coordination strategies: (1) institutional coordination; (2) specialty coordination; (3) "alter ego" coordination (working at the same institution in the same specialty);

and (4) complementary roles coordination (also known as "music and lyrics" coordination). In the second substudy, 213 couples who were both members of the American Psychological Association in 1973 and 1978 provided data on career transitions that moved them closer or farther away from one of the four coordination strategies. There was a slight tendency for the career transitions to move couples away from rather than toward coordination. In the third substudy, the co-publishing and separate publishing histories of APA couples were traced through computer searches of Psychological Abstracts. Results of these studies will appear as a chapter in the book, DUAL CAREER COUPLES, to be published by Sage in 1980.

ENERGY

DIFFUSION OF SOLAR ENERGY EQUIPMENT

Everett Rogers, Dorothy Leonard-Barton, Tamara Avi-Itzhak, and Ronny Adhikarya conducted a two-phase study of the diffusion of residential solar equipment among homeowners in California for the State Energy Commission. In the first phase, 111 San Francisco Bay Area homeowners who had purchased "active" solar systems (that is, solar panels) to heat their swimming pools, their homes, or their domestic hot water, were interviewed in their homes. The objectives of this study were to identify the information sources utilized, the motives which inspired purchase, and the factors which entered into the purchase decision. At the same time 104 non-adopting, immediate neighbors were interviewed. These were cohort individuals who had the same opportunities and roughly similar resources to the adopters, but who had either never considered purchasing solar or who had decided against such an investment. Among many other findings, the study showed that interpersonal communication sources were very important in the purchase decision of solar equipment.

The second phase of the study is the analysis of data gathered by Field Research Associates for the California Energy Commission from a state-wide representative sample of approximately 800 homeowners. The personal interviews provide data about information sources and potential barriers and incentives for the adoption of residential solar equipment. The analysis will be completed in January, 1980.

VOLUNTARY SIMPLICITY

In a series of studies, including those on the diffusion of solar energy for the California State Energy Commission, Dorothy Leonard-Barton and Everett M. Rogers have explored the behavioral indicants and the implications of a Voluntary Simplicity lifestyle.

An index of such behaviors as recycling goods, bicycling for transportation, eating little meat, taking classes to increase self-sufficiency, etc., is being refined. In the solar diffusion study, the index differentiated clearly between homeowners who purchased hot water heating systems and those who bought solar heaters for their pools. This conservation and ecology-oriented lifestyle has potential implications for consumption patterns in the U.S., if it spreads as other such social movements have, from the West Coast eastward.

PROFESSIONAL AND INDUSTRIAL COMMUNICATION

ASSESSING THE INFORMATION ORIENTATION AND BEHAVIOR OF SCIENTISTS AND ENGINEERS

This study by Georg Lindsey for his doctoral dissertation examined survey data for 502 scientists and engineers who responded to a 691 item questionnaire eliciting situational, interpersonal, and behavioral data with respect to their information attitudes, orientation, and behavior. These data were gathered and analyzed at several levels. Forty-two scales and indices were developed and subsequently arranged in a theoretically derived analytical model. The results strongly supported the analytic model.

Organizations were viewed as complex, multi-dimensional systems; general rules and methods for organizational analysis were postulated, tested, validated, and replicated. This approach produced information amenable to policy analysis by decision makers, and served as an exemplar of an alternative to those studies which have focused on the level of "individual difference" and two-variable causal relationships.

Broad implications for the examination of scientific and technical information (STI) at the theoretical, the model building, and the practical levels were discussed. At the theoretical level the conceptualization of STI behavior as a three stage information processing system is advanced and supported. At the level of the analytic model, analysis of STI data according to situational, environmental, evaluative, and task related variables was found to be a fruitful method of inquiry and analysis. At the practical level this method of analysis was found to produce results of high utility to STI systems managers and designers.

EVALUATION OF PRACTITIONER INFORMATION SYSTEMS

An evaluation of the information service (WESTFORNET) provided to Forest Service professionals throughout the Western United States was

conducted by Andrew Hardy, Marilyn Fife, Mary Hadley, and William Paisley. The evaluation involved both in-depth interviews and a mail survey of Forest Service professionals. It was found that in one year of service WESTFORNET has reached a high level of acceptance -- about 70 percent. The major service provided is a Monthly Alert of recent literature relevant to Forest Service personnel. Its primary use is for current awareness. Other services are used less because of lack of knowledge and greater difficulty of use. Recommendations made to the Forest Service included: (1) more training in the understanding and use of WESTFORNET should be undertaken; (2) in addition to library-type resources, WESTFORNET should process and distribute several types of documents created in the western forests themselves, such as environmental impact statements.

The National Science Foundation is sponsoring a related study, also being conducted by Hardy, Fife, Hadley, and Paisley, that seeks to develop a theoretical framework for explaining the information-seeking behavior of practitioners and for predicting practitioner's use of new information services. Data collected for the WESTFORNET evaluation are being combined with data on actual service costs and perceived costs/benefits to users.

TECHNICAL ASSISTANCE ON TITLE I EVALUATION IN SCHOOL DISTRICTS

William Paisley served on a panel appointed by HEW's Assistant Secretary for Planning and Evaluation (ASPE) to review the performance of the USOE program to deliver technical assistance on Title I evaluation procedures to school districts. About 14,000 of the nation's 16,000 school districts have Title I (compensatory education) programs, and all are obligated to evaluate student progress and to submit evaluation reports to state education agencies and the federal government. Since 1977, USOE has funded a technical assistance center in each of the ten HEW regions in order to make expert technical assistance available to school districts during the planning, administration, and analysis of Title I evaluations. The ASPE review panel site-visited all state education agencies and Title I technical assistance centers, as well as a large sample of school districts receiving technical assistance. In its report to the Assistant Secretary, the panel proposed several alternative dissemination models that might also help to increase the evaluation capacity of school districts.

INNOVATION IN THE PRIVATE SECTOR

Everett Rogers, Victor Walling, and Dorothy Leonard-Barton, with the assistance of David Gibson, conducted an NSF-sponsored project to model the innovation process in private firms. The modeling effort drew on case studies of two industries centered in Northern California: the semiconductor industry and the solar flat plate collector manufacturing industry. The first was selected as a

very high-growth maturing industry, and the latter as a neophyte, still highly unstable industry. The study addresses the questions of how the innovation process is initiated, how it can be determined to be functioning adequately in firms, how it differs in the private versus the public sector, and in new versus established industries. Special attention was given to how federal and state government policies affect the rate of innovation in private firms. An Institute report on this research will be forthcoming in early 1980.

FORMATIVE EVALUATION OF TELEVISED ENGINEERING EDUCATION

Sharon Stover is conducting a formative evaluation of televised continuing education for engineers. The television programs originate in the Stanford School of Engineering under the direction of Ken Down.

MASS TRANSIT COMMUNICATION

In November 1977, Everett M. Rogers, Kay Magill and Ron Rice began Phase I of a three-phase study of the diffusion of urban mass transportation innovations, sponsored by the Urban Mass Transportation Administration (UMTA) of the U.S. Department of Transportation. The objectives of this project are (1) to learn more about the process through which technological innovations are adopted or rejected by local government agencies, and (2) to determine ways of increasing the effectiveness of a local government agency's utilization of research on technological innovations. Since the Federally-sponsored demonstration project is one of the major mechanisms through which innovations are promoted by the Federal government to urban governments, this study investigates in particular the ways in which local government agencies know about, evaluate, and implement (sometimes in a modified form) the urban mass transportation innovations promoted by UMTA's Service and Methods Demonstration Program (such as vanpools, auto-restricted zones, priority lanes for buses and carpools, and services for special or transit-dependent users).

Phase I of the research project, a series of ten in-depth case studies of the innovation process for a single urban mass transportation innovation, Dial-A-Ride, was completed in 1977-78. Findings from the Phase I research are presented in an Institute report, THE INNOVATION PROCESS FOR DIAL-A-RIDE (1979), by Everett Rogers, Kay Magill and Ronald Rice. Among these findings are (1) the importance of private consulting firms (external to the local government agency), (2) the need for federal sponsors of technological innovations to understand that local government agencies will "re-invent," or modify, the innovation to

suit the local situation, and (3) the need for evaluative reports of demonstrations which address the information needs of potential adopters more directly than those currently being produced.

Phase II of the three-year research project, a series of nine in-depth case studies of three additional urban mass transportation innovations (vanpools, auto-restricted zones, and priority lanes for buses and carpools) was completed in 1979 by Everett Rogers, Kay Magill, Tom Shanks, Marilyn Fife, Joung-Im Kim, and Jeff Charles. Findings from Phase II will be published in an Institute report to be completed in early 1980.

Preliminary findings from Phase II of this study include:

1. While a single adopting organization is responsible for the ultimate yes/no decision regarding the adoption of an urban mass transportation innovation, the collaboration, approval, or cooperation of other organizations (public and private) is required for political, jurisdictional, or financial reasons.
2. The initial consideration and development of the general concept of the innovation ordinarily occur at the local level. A small number of principal actors, both from within the adopting organization and from organizations external to it, coalesce around (1) the identification of needs in an area of concern and (2) the development of alternative strategies for dealing with high-priority needs, thus setting a local agenda.
3. The impetus for matching the needs on the local agenda with the particular innovation ultimately adopted by the local government organization frequently comes about as the result of an overlap between the local agenda and the Federal agenda. The Federal agenda for urban mass transportation innovations results from UMTA's perception and analysis of what local needs are (both in general and in the case of particular cities).
4. The availability of Federal funding is necessary (but not sufficient) for an innovation-decision by a local organization.
5. The primary (and often only) channel of communication about the urban mass transportation innovations studied is interpersonal. Sources of information include informal contacts at conferences, contacts with individuals involved with similar projects in other cities or states, and other personal and professional relationships.
6. Site visits to both demonstration and non-demonstration sites are important as (1) a means of observing an innovation in operation, and (2) a facilitating mechanism for the development of personal contacts.
7. Printed information about the innovations studied is available in much greater quantity than is -- or can be -- used by respondents.

There are frequent complaints that written materials are out-of-date by the time they are distributed to local government officials.

8. The influence of UMTA-sponsored demonstrations on potential adopters who become, or apply to become, demonstration sites themselves is quite strong. This influence frequently takes the form of a financial incentive; the demonstration of an innovation at another site, or the announcement that Federal funds will be made available to demonstrate a particular innovation, indicates to the potential adopter/demonstrator that a request for Federal funds to implement and/or demonstrate that innovation will very likely be granted.

Phase III of this research project, to be conducted in 1980 by Everett Rogers, Kay Magill and Tom Shanks, will consist of three interrelated activities. The first of these will be the tracking of site visitors to four selected UMTA-sponsored demonstration sites in order to determine (1) the frequency and type of visits to each site, and (2) the uses to which visitors put information gained by a trip to a demonstration site. The second activity will utilize the findings of the earlier research in an effort to design and evaluate a communication strategy for disseminating information about the innovations demonstrated at two UMTA-sponsored demonstration sites. This research activity will be conducted by Kay Magill, as part of her Ph.D. dissertation research. The third research activity will be the planning and organization of a conference designed to disseminate the results of this project and related research to Federal and local policy-makers involved with urban mass transportation or other technological innovations.

MASS COMMUNICATION AND DISASTERS

Everett M. Rogers is Chairman of the National Academy of Sciences-National Research Council's Committee on Disasters and the Mass Media, whose purpose is to study the relationship between the mass media and natural hazards like hurricanes, floods, earthquakes, and droughts. As one part of the Committee's activities, funding was provided to Everett Rogers and Rahul Sood to conduct a study in 1979-80 on the "Role of the Mass Media in Reporting on Natural, Quick-Onset Disasters." They conducted an on-site investigation of two mass media institutions (e.g., one local television station and one newspaper) covering a disaster. The study is based on observation, personal interviews, and content analysis of the media. This study dealt with the Seattle snowstorm of the winter of 1979-1980.

It is expected that a more thorough understanding will be gained of the role of the mass media in reporting on disasters. The study will

provide answers to the following questions: What are the criteria by which the news value of a disaster is judged by the mass media (e.g., number of deaths, amount of property damage, etc.)? Who in a media institution determines the news value of a disaster? What is distinctive about mass media news-gathering operations in a disaster? How is coordination between different media accomplished? Is there a "convergence" problem in which large numbers of individuals (including reporters) concentrate in the disaster-impacted area? What restraints and bottlenecks impede the optimum operation of the mass media in a disaster context? How accurate is the media's coverage? How are rumors treated? What is the information-gathering process in a disaster?

In August, 1979, a parallel study was conducted of Hurricane David in Dominica, a small Caribbean nation that was especially hard-hit. The two investigators received funding from the National Hazards Research and Applications Information Center, at the University of Colorado, Boulder, Colorado, which in turn is funded by the National Science Foundation (to sponsor several short-term, quick-response investigations into different aspects of disasters).

After several months of planning and preparation, Rogers and Sood flew to the island-nation of Dominica, in the Eastern Caribbean, in August, 1979, arriving there less than three days after Hurricane David had struck (and at the same time that most mass media representatives were arriving). During the following four days, Rogers and Sood studied these mass media personnel in Dominica as they conducted news-gathering activities. Similar research questions to those listed previously were pursued.

A research report on media operations in Dominica is available. A comparison of mass media activities in Dominica and Seattle will be the basis of Sood's doctoral dissertation.

OTHER RESEARCH AREAS

HUMAN-COMPUTER INTERFACE

In future use of computers for education and work, structure and presentation factors of computer displays can be adapted to the needs and preferences of individual users. Content in digital storage can be displayed in alternative structures such as prose, graphs, arrays, etc. Displays can also vary in presentation rate and visual/auditory modality. William Paisley conducted an experiment on the effects of presentation rate on comprehension and on performance of post-display tasks. This experiment varied the cathode-ray-tube display rate of

scientific texts from 250 to 650 words per minute. Comprehension gain scores showed that display rate interacted with participants' science background and computer experience. Comprehension gain was inversely related to display rate, but participants with much computer experience gained more information from the texts at the fastest rate than did participants with little computer experience at the slowest rate. Faster display rates also paced more rapid performance of the post-display task, confirming the momentum hypothesis rather than the compensation hypothesis of the effect of display rate on post-display task performance.

SOCIO-POLITICAL EFFECTS OF THE COMPUTER

This study by John Hochheimer, a companion paper to a review of computer impacts on organizational and interpersonal communication by Ron Rice, examined the introduction of computers in the American electoral process. Issues addressed are:

1. The computerization of the polling place.
2. Using home computer terminals for voting.
3. The effect of cable TV systems on the polity.

The possible effect on democratic values which may occur as a result of the use of these new technologies was discussed, as well as a description of some problems (in reliability, security, and utility) that systems implemented prior to June, 1979, have encountered. Recommendations for future action were made.

A paper on this study will be presented at the 30th Annual Meeting, International Communication Association, to be held in Acapulco, Mexico, in May, 1980.

INSTRUCTIONAL TELEVISION AND THE ADULT LEARNER

This report by John Hochheimer and Thomas Shanks was commissioned by the San Mateo County Community College District. Drawing upon a number of data bases, the report categorized the research conducted since *LEARNING FROM TELEVISION: WHAT THE RESEARCH SAYS* (Godwin Chu and Wilbur Schramm, 1967) on the use of instructional television to teach basic skills to adults. The report was organized to answer the following.

1. Who learns from television? Specifically, do adults learn from television?
2. What are the most effective roles television can play in the instructional process?
3. How can instructional television programs best be designed?

4. What is the most effective model for the development of an instructional television project?

The report concluded with an annotated bibliography of the research most pertinent to answer these questions.

A second report, on designing instructional television for engineers, will be presented at the 30th Annual Convention of the International Communication Association, to be held in Acapulco, Mexico, in May, 1980.

CONFERENCE ON PUBLIC COMMUNICATION CAMPAIGNS

Work began in 1979 to organize a 1980 National Conference on Public Communication Campaigns, to be held at Asilomar on October 6th and 7th. The conference is sponsored by the National Wildfire Coordinating Group and will draw upon the experience of public communication campaigns in several fields to improve campaigns mounted by the U.S. Forest Service and other agencies to prevent wildfires. A few of the conference speakers include William McGuire (theoretical foundations), Edward Palmer (the role of formative evaluation in production), Thomas Cook (field evaluation), and health campaigns (Nathan Maccoby). Ronald Rice and William Paisley are the co-organizers of the conference.

DISSERTATIONS

The following dissertations were completed in 1979:

Janice Bleil

"A Generalized Computer-Based Audio Visual Authorship System to Support Design, Construction, and Maintenance of Audio-Digital Instructional Products for Interactive Computing"

Noreene Janus

"The Multinational Advertising Industry in Developing Nations"

Georg Lindsey

"An Analytic Model for Assessing the Information Orientation and Behavior of Scientists and Engineers"

Russell Stockard

"The Social Construction of Television in the Public Interest"

PAPERS AND PUBLICATIONS

This section summarizes recent writing activities of Institute members. More details on many of these activities are provided in earlier sections of the Annual Report.

The books and monographs in print are available either through the publisher or through commercial book sellers. Reprints of articles and papers are, in some cases, available from the authors in care of the Institute.

While copies remain available, reports published by the Institute for Communication Research may be ordered directly from the Institute for a nominal postage and handling charge.

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