ANNUAL REPORT OF RESEARCH IN PROGRESS

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International Communication Studies

The El Salvador project, which is a long-term evaluation of an educational reform built around instructional television, is now in its fourth year and has 18 months more to go. Robert Hornik returned to Stanford in January after 18 months in El Salvador, and Henry Ingle took over in January, 1972, as field supervisor. Data for the third full year of observation is now being fed into the computer, and a preliminary report of the year will be ready by the end of March.

The reform project, of course, is much more than a television project. It includes an extensive curricular revision, new workbooks and teachers' guides, a year's retraining for every teacher participating, remodeling of some schools and building some new schools, a complete revision of teacher training, and other elements. Television has emerged through the years of the experiment as the chief catalytic element in making all the changes possible and knitting them together.

The reform has now moved through the 7th, 8th, and 9th grades. Pupils continue to make large gains in the new classes. Attitudes continue to be highly favorable, and the rate of dropouts is very low. During the school year just concluded, there was a teachers' strike, lasting several months, chiefly over salaries. The effect of this on pupils' academic achievement will not be known until the current data
are analyzed.

Among the new studies completed this year were a cost analysis by Professor R. E. Speagle, of Drexel University; a study of student aspirations for further education and careers, related to their family backgrounds and their educational experiences, by John Mayo; and an administrative history of the project by John and Judith Mayo.

The cost study shows that the complete educational reform through 1971 has cost approximately $14.6 million, and through 1973, by which time a number of new schools will have been built, it is expected to cost $30 million. Capital costs are about 70 per cent of this. Through 1971, the costs of ITV have been about one-fourth of the total. Present programming cost is about $720 an hour, averaged over three years with a normal amount of revision. At the present time, the annual cost per student, without television, in the Salvador schools at Plan Basico level, is estimated at $101. To this, television adds $14.40. This is about 5.6 cents per student per television hour. As these costs are sensitive to economies of scale, the unit costs will go still lower as the reform expands. The real opportunity for saving, however, will come if and when Salvador decides to use ITV for rural education and teacher training, where it would not merely be added on, at additional cost, to an existing system, as it is now.

One of the findings that emerges from the Mayos' administrative history of the project is the length of the incubation period. Instructional television was being seriously considered in El Salvador as early as 1960, and a national commission was working on ITV beginning in 1963. It took until February of 1969, however, to get ITV on the air and into the classrooms. No other document in print so well covers the process
and problems of moving from the idea of instructional television to the actuality. An interesting feature of this process in El Salvador was the degree of leadership that Salvador maintained throughout the nine years of planning and preparation. There was some outside financing, but, contrary to some other experiences, very little direction was imposed from the outside. In a very real sense, it was a Salvador project, planned and accomplished by the users.

The study of student and parent aspirations (which also became Mayo's doctoral dissertation) dug into the roots and interrelationships of the sharply elevated career and educational aspirations that have apparently accompanied and been contributed to by the educational reform. Less than 30 per cent of the parents of the children presently in Plan Basico (7th, 8th, and 9th grades) have gone even as far as the sixth grade. Yet 95 per cent of the students aspire to go beyond the 9th grade, and 40 per cent want to go to universities and enter professional occupations. This points to possible frustration on the part of the students, most of whom will find no university places and no openings in the professions.

One of the new studies being undertaken in the fourth year of research is intensive observation of two classrooms which are using ITV for the first time.

The following reports of the El Salvador project have appeared since the last Annual Report:


A study of Television and Its Lower-Cost Alternatives began in the summer of 1971, and will continue through spring of 1973. It is financed by the U. S. Agency for International Development. Wilbur Schramm is the principal investigator, and Emile McAnany, John Mayo, and Dean Jamison (economics) are giving major portions of their time to the study.

The study is aimed at better knowledge of the cost-effectiveness of different ways of using instructional television, and also of some uses of radio and radiovision. The most intensive field work will be done in Mexico, where studies will be made of the telesecundaria -- a system that makes secondary school available by means of television and monitored classes in villages where no secondary schools exist, and the radioprimaria -- a system which extends three-year primary school to six years by means of radio and part-time teachers. McAnany and Mayo will be chiefly responsible for these field studies.

In addition to the Mexican studies, summary and interpretive reports will be prepared on three classes of media use for instruction in less developed countries. These are:

- IT V as a vehicle of educational reform;
ITV and radio as devices for extending the school;
Radio and radiovision as alternatives to instructional television.

The first of these will deal with the three major uses of ITV for educational reform -- El Salvador, Niger, and Samoa. Data on Salvador are already available, of course, from the Institute's ongoing study. Data on Niger are now being put together by the French research team that spent several years observing the project and will receive further analysis at Stanford. A large amount of new quantitative data is being gathered in Samoa. Schramm and Lyle Nelson spent some time there this summer, and testing will continue throughout this school year.

The use of television or radio plus correspondence study for extending educational opportunities beyond the school or the campus now appears more and more promising, both to the less and the more developed countries. Cases and cost analyses will be made of existing projects in Japan, Kenya, Australia, Bavaria, the United Kingdom ("The Open University"), and probably Poland.

Radio has tended to be passed over in favor of its more glamorous sister television despite encouraging evidence of its ability to teach and its demonstrated low cost. The third of the areas mentioned above will, therefore, include case studies and updatings of cost and effectiveness figures on several radio and radiovision projects in Africa, Latin America, and Asia. The 1961 field study of radio teaching in Thailand will be repeated.

In addition to these sub-studies, a series of theoretical and methodological papers on social and economic research topics will be prepared. Those that have appeared thus far include:
The methodology of instructional cross-media comparisons;
The methodology of instructional cross-media case studies;
The research on content variables in instructional television.

McAnany is serving as consultant on evaluation for the Ivory Coast instructional television project which got under way in September, 1971.

IVORY COAST ITV

This will be a major use of television, comparable in extent to the projects in Samoa, Niger, and El Salvador, and is expected actually to reach many more pupils than any of these previous projects. The World Bank, UNESCO, and several national donor agencies, including U.S.AID, are cooperating in support of the Ivory Coast project.

McAnany will be in charge of putting together a team of three or four American researchers who would consult several times during the year with Ivory Coast Ministry of Education people. The probable areas of consultation are feedback systems for the ITV project, testing, cost-efficiency of the system, and data analysis for information needs of those running the ITV project. The actual work will probably begin in February and continue for about a year. The special importance of the Ivory Coast project is that it is the first African country to undertake a large scale use of educational technology, and many other countries will be looking to it for guidance in their own decisions over the next five years.

A monograph on Communication in Family Planning, by Schramm, was published in April, 1971, by the Population Council of New York. Among other things, the document reviews the research and experience on using communication in support of family planning campaigns, and includes descriptions, based on field observation,
of the programs in Lebanon, Afghanistan, Uganda, Colombia, El Salvador, Hong Kong, India, Kenya, Iran, Taiwan, and the Republic of Korea.

Last summer, Peter Spain did a basic listenership study for a radio station in the rural Philippines. He tried to find out who listened to what programs how often, to provide the radio station with some idea of its penetration of the audience.

It was a random sample of 48 barrios selected in a rural area containing 779 barrios. The method was a questionnaire, administered by Filipino college students. Training sessions with the students concerning the questionnaire and the interview technique were held.

The Process and Effects of Mass Communication, by Schramm and Donald F. Roberts, was published late in 1971. This is the second edition edition of an influential book, originally issued by Schramm in the 1950's. The great changes in the field since that time have resulted in a revision that includes only a few papers from the former edition.

Educational Media and Technology

The ERIC Clearinghouse on Educational Technology, with Don H. Coombs as director, is completing its fifth year of operation. The Clearinghouse is operated for the U. S. Office of Education by the Institute for Communication Research, and is housed in the "D" wing of Cypress Hall.

About sixty documents a month are selected and processed into
the national ERIC document system. Emphasis, however, has been placed on the commissioning of papers and the dissemination of appropriately packaged information on instructional technology.

ERIC at Stanford issued a paper on **Black Voices and Format Regulations: A Study in Black-Oriented Radio** by Anthony J. Meyer, S. J., based on a study of black-oriented broadcasting in 1970. The paper describes the research findings and offers suggestions for change in black-oriented radio, which the author contends has failed to serve the public interest.

Another ERIC publication discusses characteristics of successful students in research training programs and characteristics of successful programs. **Identifying and Fostering Productive Researchers** was written by Andrew W. Collins, who searched related research literature and offers suggestions for future avenues of research.

A project to introduce library science students to the rapidly evolving theory and technology of information science resulted in Irving M. Klempner's **Audiovisual Materials in Support of Information Science Curricula: An Annotated Listing with Subject Index**. The ERIC-commissioned report included a list of 195 audiovisual aids.

**The State of the Art of Instructional Films**, by Charles F. Hoban, discusses the changing boundaries of instructional film, recent technical developments, and research in that field. The publication is one expert's subjective view of the field of instructional film, combining philosophy and fact.

Edgar Dale and John Belland authored **A Guide to the Literature on Audiovisual Instruction**, which includes a philosophical overview concentrating on the historical background of the field and its place...
within the broader fields of education and communication theory and research. The bibliography identifies relevant print and non-print material, organizations, and publications.

Also issued was *Instructional Technology Subject Matter Descriptors: A Subset of the ERIC Thesaurus*, with an introduction by publications associate Michele Timbie of the ERIC Clearinghouse. This was a structured list of ERIC terms used in indexing instructional technology documents.

The ERIC Clearinghouse produced the 21-page research abstract kits which were distributed to all attending the 1971 Association for Educational Communications and Technology (AECT) convention research sessions. An abstract of each paper presented was included in the kit. During the year, the Clearinghouse staff also planned and manned exhibits at national conventions of the Special Libraries Association in San Francisco and the Association for Educational Communications and Technology in Philadelphia.

Some idea of the volume of communicating done by the Clearinghouse staff is indicated by annual figures. There were 5,782 requests for information, most received by mail. Some 485 of the requests were made during personal visits. A good many of these were given special attention by staff members familiar with the research literature.

*Now Available*, the ERIC at Stanford newsletter, was issued approximately every three months and circulated to 5,000 individuals in this country and overseas who had requested it. The newsletter combines an "alerting service" (notice of particularly interesting documents new to the ERIC system) with short features on instructional technology.
Columns prepared for regular publication in five journals and newsletters contained news of Clearinghouse activities and identified particularly significant documents in the ERIC system. Among the journals were: Audiovisual Instruction, AV Communication Review, Association for Educational Data Systems Monitor, Educational Broadcasting Review, and Educational Screen and AV Guide.

During the year Coombs served as research editor of AV Communication Review, the quarterly journal of the Association for Educational Communications and Technology. He was also one of three editors responsible for the founding of Simulation/Gaming/News, an access-oriented publication covering a wide variety of the aspects of simulation and gaming.

Wilbur Schramm was co-author (with Robert Filep of the Institute for Educational Development) of a report on the evaluation of Title VII of the National Defense Education Act which, between 1958 and 1968 put a little over $40 million into research on and development of instructional technology. The evaluation was done under the auspices of the Institute for Educational Development, and has been published by the U. S. Office of Education. The evaluation concludes that Title VII did make a substantial contribution to the field of instructional technology, but recommends some changes if any subsequent legislation of a similar nature is considered.

The evaluation, The Impact of Research on Utilization of Media for Educational Purposes, is available from the Institute for Educational Development, 999 North Sepulveda Boulevard, El Segundo, California 90245.
Educational Information Needs and Lifetime Learning

The Paisleys are conducting two projects for the U.S. Office of Education. William Paisley and Colin Mick are directing a "sensing network" study to develop a continuing methodology for determining the information needs of educators. Matilda Paisley and Douglas Hall are directing a study on effective promotion of "lifetime learning" programs.

The federally-coordinated educational information system now has the capacity to respond flexibly to educators' information requirements. However, no mechanism exists for continuing feedback of information requirements to communication policymakers, program administrators, and technical staff. The "sensing network" study is testing seven data gathering techniques, ranging from a national survey to unobtrusive measures. In addition to the national survey, there will be convention studies, a longitudinal "consumer panel" study, a follow-up survey of educators who have written query letters to information centers and clearinghouses, a survey of educators in new positions, content analysis of articles appearing in state education journals, and an analysis of queries received by an INWATS "hotline". The first wave of the "hotline" has just been completed. Richard Farr is in charge of that substudy. A second wave of data will be collected when Farr operates the "hotline" for educators again this spring. Other graduate students working on this project include Kenneth Bowman and Robert Hawkins.

The "lifetime learning" study is based on the report of the Carnegie Commission of Higher Education which stressed the need for
LIFETIME LEARNING educational opportunities to be available to persons throughout their lifetimes. If continuing education is to fulfill the role envisioned for it, adult education programs will have to be successfully promoted. The purpose of the project is to provide the Office of Education with data on existing promotion practices and case study reports of the best promotional programs. The three phases to this project are:

1. A survey to identify all programs of continuing education in institutions from high school through university level.

2. A survey of the promotion/public information directors of continuing education programs to ascertain the nature and extent of their promotional activities.

3. Site visits to the ten most effectively promoted programs.

Since the case studies must be relevant to a wide variety of programs, the two most promising promotion efforts in each of the following categories will be site-visited:

- School district, secondary school locus
- School district, junior college locus
- Private four-year college or university
- Public four-year college or university
- State-coordinated extension program.

The Paisleys organized a round table discussion on "Nonexperimental Causal Inference" at the 1971 American Association of Public Opinion Research Conference. Research in natural settings usually lacks the randomization and control of a true experiment. Strong inference in nonexperimental research depends
son that her experimental procedures to "restore" some of the rigor of a
real experiment. Many such procedures have been proposed. None is
prima facie the best; all have conceptual shortcomings and statistical
aflafts. An attempt towards "dualization" of nonexperimental causal
inference was expected to offset the lack of conceptual groundwork in
real data. I now am presently to progress that elaborates the axioms,
regards, and use in non-operational domains. The five nonexperimental
ideas, which have been currently in use, are described and discussed
because they are the conceptual background. Points discussed include
adding time versus statics and multiple-time data; static versus
change; regression analysis of variables; bivariate versus multivariate
panels, expected versus unexpected changes; continuous data; and appropriate
metathetical and examining causal dependency.

Information Science

The National Institutes of Health sponsored doctoral training
course in information science continued in its second year
Informations
with eight trainees participating in the program.

As a result of the program, five new courses have
been added to the Communication Department’s course
offering beginning in the fall of 1971. They are:

1. Introduction to Information Science, describing the
organization, artificial and growth of data collections;

2. Flow of Information among Scientists, giving an overview
of the information systems of science;

3. Flow of Scientific and Technical Information to the
Public, showing how the public is exposed to scientific
and technical information;
4. **Computer Information Systems**, introducing the student to those basic quantitative techniques useful in the design and analysis of complex systems;

5. **Telecommunications Systems and Public Policy**, providing an analysis of potential social consequences and public policy issues arising out of the rapidly changing telecommunications technology.

During the spring quarter of 1971, a colloquium series on the general topic of Information Science and Telecommunications Policy was held.

At a recent convention of the American Society for Information Science, Thomas Martin, a third year trainee, was elected chairman of a special interest group sponsored by ASIS on user on-line interaction. During the fall quarter of 1971, Raymond Panko, a second year trainee, was consultant to the Office of Telecommunications Policy at the Department of Health, Education and Welfare on educational and medical satellites. The first graduates of the program, directed by Edwin B. Parker, are expected to receive their Ph.D. degrees in 1973.

The National Science Foundation sponsored project SPIRES (Stanford Public Information REtrieval System) is continuing under the direction of Parker. The SPIRES Project has combined with Stanford's library automation project BALLOTS (Bibliographic Automation of Large Libraries Using a Time-Sharing System) and the two projects are administratively managed by Hank Epstein. John Schroeder is manager of the system development group for SPIRES.

SPIRES I continues to provide an on-line information retrieval service for physicists at the Stanford Linear Accelerator Center (SLAC). Presently, SPIRES I is accessible on the IBM 360/91 from any SLAC terminal and from terminals on campus and elsewhere that have telephone dialup and entree to a SLAC account.
SPIRES II, the production system, has two long-range goals. One is to provide a user-oriented, interactive, production on-line information storage and retrieval system for a variety of research groups in the Stanford community. The second is to support the automation efforts of university libraries (BALLOTS) by contributing to common software development. To implement these goals, SPIRES II is making solid achievement in both areas of hardware and software. Within the area of hardware, new fast-access disk storage drives providing storage space for approximately 28-million characters have been added. A PDP-11 front-end computer which will provide faster communications between SPIRES and the CRT terminals has been added. An upper/lower case CRT terminal (Sanders Associate 800 series) and a less expensive upper-case only CRT terminal (the Hazeltine 2000) are being added to provide fast, silent display of large amounts of data.

In the area of software, the file definition compiler is now generating a full set of file characteristics. The search semantics are near completion and are now fully interfaced with the new file characteristics. The on-line tutorial commands, such as the physical browse command, the help command, the explain command, the example command, and the show search terms command, have been implemented.

Two major documents describing the SPIRES II system were written during 1971. The first is the Requirements for SPIRES II, which describes the system functions and capabilities from the user's viewpoint. The second is the Design of the Stanford Public Information REtrieval System (SPIRES II), Volume 1, which is a technical document describing the general design and structure of the SPIRES II on-line processor and its
batch support programs. Recently completed is the SPIRES Annual Report for 1971 which details the background and present development of both SPIRES L and SPIRES II. These documents are available from the SPIRES/BALLOTS Project, Stanford University, Stanford, California 94305.

Plans are now underway for a user manual, which will be seven self-contained volumes giving "how to" instructions for selecting and searching a file, building or modifying files, and defining files.

Martin, along with Sigfried Treu (University of Pittsburgh) and Jim Carlisle (Yale), conducted a one-day workshop titled, "The User Interface for Interactive Bibliographic Searching - Part II", at the annual meeting of the American Society for Information Science in Denver, Colorado on November 9, 1971.

Before the workshop, a list of 147 proposed features of a man-machine interface for bibliographic searching was sent to the participants. The information scientists were asked to rate each feature on a one to five scale (1=too inflexible, 3=just right, 5=too flexible). There was significant consensus on 69 of the 147 features. Discussion at the workshop focused upon factors intentionally ignored in the feature list. For example, should interaction with the user depend upon whether his terminal is a CRT or a teletype?

As a result of the workshop, a new ASIS special interest group was formed which Martin and David Thompson will head. The goals of the group will be:

1. to encourage the development, investigation, and refinement of on-line interaction models as they relate to various user, computer system, and information environments;
2. to encourage utilization of the models for highlighting common features and functional differences in existing or proposed user/system/information interfaces; and

3. to encourage the adoption of compatible interfaces in response to common environments.

An Interactive Statistics System (INTERSTAT), developed in 1971 by students from the Institute, is currently available for limited use on the Stanford 360/67 computer. One statistical subprogram, an interactive cluster analysis routine, has been implemented under the INTERSTAT system.

INTERSTAT is available from a data set via the Stanford text editor, and can be loaded under the Stanford time-sharing monitor with one command. Once loaded, INTERSTAT is ready to accept commands to guide statistical analysis.

The system has been the work of Colin Mick, Allan Prentice, and Jesse Caton. The INTERSTAT monitor was modified from the SPIRES/BALLOTS monitor developed by Tom Martin, Dick Guertin, and others.

The future development of INTERSTAT can be understood as two overlapping phases, both of which are well under way. Phase I will continue to build upon the system described above, achieving the implementation of a complete interactive library of commonly used statistical programs. Phase I can also be understood as development required to precede research.

The user population attracted to the new INTERSTAT system will be studied extensively under Phase II. The key to this approach is that understanding human behavior is essential to maximize system usefulness and efficiency. Not only system designers, but eventually the system
itself must develop an understanding of user behavior.

Thus, the goal of Phase II is to conceptualize and implement a new approach to statistical data analysis, bringing in knowledge from areas such as artificial intelligence, information science, and computer-assisted instruction. Such a system would allow ease in pursuit of many alternate analysis strategies by keeping complete records of all analysis steps, thus providing the ability to back-track to any previous decision point. In addition, the system would give "intelligent" guidance by evaluating the appropriateness of the selected methods and by adapting to the specific user (e.g., novice versus experienced). A student group began conceptual work on Phase II in the fall of 1971 directed by William Paisley.

Mick has continued his research on biomedical communication and information seeking with two projects, the second of which was the basis for his dissertation.

The first study was an analysis of journal checkout patterns displayed by Stanford medical students during one academic quarter. Results indicated that journal use by medical students seems to peak during the latter part of clinical training. Pre-clinical students engaged in research were found to check out more journals than did their non-research oriented fellows. This trend did not carry over into clinical training.

The second project was a policy-oriented study of information seeking style in medicine. Data for this study was gathered through a series of 120 interviews with medical students, interns, residents, faculty, and practicing physicians.
Analysis was divided into two parts. First, the criterion variables were analyzed (a set of 147 variables recording information on information seeking behaviors), and then the effects of a set of predictor variables of the criterion variables were tested. During the first part of the analysis the respondents were grouped together by information seeking style through a Q-type cluster analysis and the criterion variable structure was simplified through a series of operations including variable testing and deletion, R-type cluster analysis, and R-type factor analysis.

Eight information seeking style groups were identified and a five-factor structure was developed to represent the criterion variable. The factors included personal sources (basic), personal sources (notes), personal sources (files), interpersonal sources, and extrapersonal sources. Attempts to find effective predictor variables were, for the most part, unsuccessful. An age or career level variable seemed to be most effective in discriminating the criterion variable (information seeking style).

Conclusions were that:

1. information seeking style does exist and can be described using multivariate techniques;
2. these styles appear to change over time;
3. both internal and external criteria can be effectively used to discriminate different information seeking styles; and
4. extensive use of interpersonal and extrapersonal sources appears to be dependent on level and experience.

A new course sequence designed to improve computer skills of Institute students was initiated. The sequence, taught by Mick, Caton,
NEW COURSE IN COMPUTER SKILLS and Michael Nolan, is composed of two courses. Communication 213 provides an introduction to computers, interactive text editing, statistical programming algorithms, BASIC, FORTRAN, and the use of statistical program libraries such as BMD, SPSS, and COMMLIB.

Communication 214 is an advanced seminar on statistical programming and other computer techniques applicable to communication research.

This sequence was first offered in 1970-1971 by Mick. The current INTERSTAT project is an outgrowth of the first Communication 214 class, and a number of students trained this year will also participate in INTERSTAT development.

At a Committee on Scientific and Technical Information forum on Management of Information Analysis Centers at the National Bureau of Standards in May, Coombs presented "A Case Study on User Acceptance of an Interactive Retrieval System, Some Thoughts about Case Studies, and a Thought about Legitimisation."

William and Matilda Paisley consulted with El Camino Hospital on ways to measure the impact of the soon-to-be-installed, computer-based medical information system. The attitudinal, cognitive, and behavioral components of change in administrators, medical staff, and patients were discussed as equally crucial areas for study.
The Communication of Science Information

As was promised in last year's annual report, a comprehensive report on the second and final phase of a major series of studies on communicating science was published, and joins its predecessor volume as an Institute report. In the first phase the relation of various stylistic variables to comprehension, enjoyment, attitude change towards science, and information seeking were investigated. In the second phase, these variables were subjected to experimental manipulation. The findings are presented in an Institute report entitled, Study on Communicating Science Information to a Lay Audience, Phase II, by G. R. Funkhouser and Nathan Maccoby.

As indicated in the last report, findings were based on almost 1,500 subjects -- some students from local community colleges and some samples of scientists. A great many findings emerged that could be applied to the formulation of some tentative principles of effective science writing:

1. Decide what it is that you want to communicate. If possible, think of the test you would give your readers to see how well they learned the material you want to convey, then organize your material so that if they learned it all, they would score 100 per cent on that test.

2. Use examples, analogies, general rules, and exceptions to general rules wherever these devices can be used appropriately.

3. Be explicit. State your facts as straightforwardly as possible.

4. Use as little scientific terminology as you can get away with, short of compromising the accuracy of what you want to present.

5. Use shorter, simpler sentences and shorter, simpler words.
6. Unless your article is long, there is no need to use section headings.

7. Introduce, end, and intersperse your material with something other than "hard science". Sweeten the medicine, in other words.

8. Don't get too cute.

9. Say something about the practical applications of the topic you are covering, if possible. Occasionally, for example, in discussions on the origin of the solar system you may not be able to.

10. Just because some people who are well-versed in your topic may read what you write, don't let yourself be bluffed into trying to "impress them". Our results demonstrate pretty clearly that, except for a few malcontents, experts appreciate simple, straightforward science writing as much or more than laymen do.

An article based on Phase I was published in the Journal of Communication and one based on Phase II has been submitted for publication to the same journal.

Maccoby was elected to the Board of Directors of the International Communication Association and is serving as an Associate Editor of the Journal of Communication and is on the Editorial Board of the Public Opinion Quarterly.

Studies of the New Media

Research is continuing in the NSF-sponsored Communications Technology and Public Policy under the co-direction of Parker, Donald Dunn (Engineering–Economic Systems) and James Rosse (Economics). Specific studies of technology, markets, organizational patterns, and legal liability of providers of service have been initiated. Parker and Dunn have completed a paper "The Potential of Information Tech-
ology" which is available upon request. Several graduate students within the Institute are conducting independent research under the auspices of the Policy grant. Peter Shapiro is investigating networking with the cable television industry including both direct live interconnection and exchange of tapes. Susan Krieger has been working with Parker on a study of the institutional structure of the U.S. communications industry. She recently published an article for Policy Sciences (1971) on "Prospects for Communication Policy". Richard Kletter has written a comprehensive study of the industry concerned with TV cassettes entitled "TV Cassettes: A New Hardware and Its Implications", published by the Institute. Judith Strasser undertook a provocative probe into the social consequences of cable television in her article "Cable TV - Stringing Us Along" which appeared in the March-April issue of Pacific Research and World Empire Telegram. Miss Strasser during the summer of 1971 was awarded a Russell Sage Foundation fellowship to work for the Christian Science Monitor. She wrote several articles for the Monitor on cable television. Heather Hudson served with the Department of Communication in Ottawa on a task force to develop communication facilities to serve the needs of Canada's native peoples, especially in the northern area.

One of the chief concerns of the NSF Communications Policy group is to show how the work accomplished in the program can be made available effectively to cities and user groups. Parker continues as Chairman of Stanford's Presidential Committee on Cable Television. The committee concerns itself with Stanford's interest in cable television and its liaison with Palo Alto. Parker also serves on the 18-member Palo Alto
Citizens Advisory Committee for cable television, named by the Palo Alto City Council to guide Palo Alto in the field of cable television. Parker participated in the planning and organization of a regional conference on cable television for city and county officials under the Association of Bay Area Governments given at Stanford Research Institute this fall. He participated during 1971 in cable television hearings at the Federal Communications Commission. This fall he prepared a submission to the FCC on the fairness doctrine stating that its application by the FCC for cable television should require that the cable operator maintain channel capacity and equitable access rules so that no one is unfairly denied access.

A planning grant proposal developed by Parker to the Alfred P. Sloan Foundation was recently funded for 12 months beginning January, 1972. Its purpose is to begin intensive planning and analysis on the problem of productivity in education. It is intended to explore how the need for open-access (denying no one access to education), the need for lifelong learning, and the need for increased variety of curriculum can be better met through a technology-based system rather than solely on highly expensive and limited face-to-face instruction. The work done in the planning grant will cover three planning areas: research and development planning, management planning, and technical planning. It is anticipated that a two-way cable television system will be recommended for the Stanford campus. Also expected is interconnection with the proposed Palo Alto cable system.

Parker serves as one of the principal investigators on a grant funded by the National Library of Medicine to work on the transmission via satellite of medical consultation for remote areas in Alaska. Work
on this project is closely coordinated with related work at the University of Wisconsin and the University of Alaska.

Ray Panko worked with Parker and Bruce Lusignan of Electrical Engineering in a study funded by the National Aeronautics and Space SATELLITE COMMUNICATIONS Administration on assessing the role satellite communications technology will play in public services. Two areas, medicine and education, were examined in detail with emphasis on the user orientation to the technology. The report, "Teleconferencing: Cost Optimization of Satellite and Ground Systems for Continuing Professional Education and Medical Services" is now in the final stages of completion.

Richard Miller, working with Parker and Lusignan, has for the last six months been conducting a television interference study as part of a NASA contract for the design and development of low-cost microwave adapters suitable for television reception from satellites. The purpose of this study is to assess quantitatively the effects of FM interference on television reception quality in the ITFS Instructional Television Broadcasting Network at Stanford. The results of this study should provide guidelines for future high-power direct broadcast experiments with the Application Technology Satellite F and G.

Parker is one of the investigators of a grant funded by the Urban Mass Transportation Administration of the Department of Transportation to investigate the interaction of information and urban transportation. Working closely with him on this study is Dave Jones, who will be doing research in the area of communication
as a substitute for transportation.

Parker has been appointed for a three-year term to Stanford's Committee on Research. He is also a member of an ad hoc review committee to study Stanford's indirect cost recovery, model, and rates.

**Media and the Community**

William L. Rivers is editing a clearinghouse journal supported by the Aspen Institute Program on Communications and Society. The journal focuses on four issues of public policy: Public NEW JOURNAL Broadcasting, Television and Social Behavior, Civil Television, and Media-Government Relations. A section of the journal is devoted to each issue, with an introductory article to each issue. These articles are followed by abstracts of research articles and reviews books that make up the bulk of each issue.

Other research items are announced in the Journal s Executive sketches. A portion of the Journal s Executive s Executive Committee events that are important in each of the four areas.

Lyle Nelson and Schwarz are now completing a study of the problem of financing public television. They have written a paper on that topic in 1961. In the ten years since then, public television, PTV has outrun the most optimistic predictions of what it has grown to a system of over 200 stations, and has become a national activity, although still small in comparison to the other broadcast networks. The present, however, is generally regarded as a seminal time for
public television, which is seeking for a higher standard of performance and service and does not have the resources in hand or
weight to make them happen. The expiration of the present Public
Broadcasting Act after 1972 raised the question of the amount and
organization of public broadcasting that would be necessary and desirable.

With the assistance of Tritten, a group of graduate students
undertook a feasibility survey and present analysis of a Spanish-language
radio station in Bakersfield, California, in order to
support actions by the community in improving broadcasting.

The study was undertaken at the request of the United Farm Workers
Organization Committee (UFWOC) and Community Service Organization (CSO)
and specifically charged by the Office of Communication of the United
States Information Agency. Analyses were given to the community at various
locations in the state, and the reports were written which were subse-
sequently published at the CCU's request by the UFWOC and CSO.
The two reports were "Spanish-Language Radio and the People:
A Report of Mexican-American Directed Radio in Bakersfield, California,"
and "An Examination Under a Rare Study of Our Station".

At the request of KMCU Council for Civic Unity (KCCU), an inter-
church community organization in Bakersfield, Osvaldo Kreimer and Anthony
leadership of the church delivered a survey of community leadership to help
and encourage the broadcasting needs and interests of
the Community. With the financing of the Office of
Community of the United Church of Christ, a report was written,
leadership of the community under An Ascertainment of Minority
Community Leadership Opinion in Bakersfield, California," which was subsequently filed with the FCC during license challenge proceedings.

During the past year a long-term research project was launched jointly with the Medical School on reducing risk factors related to atherosclerosis and coronary heart disease. Under the direction of Maccoby, Henry Broitrose, Judy Spellman and Janet Voelker, the Cartwright model of persuasion is being applied to the study of community change. In one community, a major multi-media communication campaign will be carried out designed to get high risk people to change their diets, exercise patterns, and to reduce cigarette smoking.

In a second community, a similar campaign will be launched, but this time the mass media will be supplemented by face-to-face groups of people whose behavior change will be triggered, it is hoped, by quasi-public commitment to other group members. A third community will serve as a control.

The medical group will obtain blood lipid readings, EKG's, and obesity measures at the outset and at the end of stated periods. Currently, an elaborate pilot study is in the field in the city of Modesto, California.

The Workshop in the Economics of the Press, sponsored by The Brookings Institution, finished its third year, with final funding to be finished in August, 1972. Still in progress by James Rosse, associate professor of economics, David L. Grey, and Bruce M. Owen, Office of Telecommunications Policy, Washington, is a monograph on American Daily Newspapers. Also in progress by Owen, Grey, and Rosse is a reader on the economics of the mass media.
The Writing Process (A Behavioral Approach to Communicating Information and Ideas) by Grey was completed and is now scheduled for publication late in 1972 by Wadsworth Publishing Co. This is a short, supplementary text attempting to provide an innovative approach to the teaching of non-fiction analytical writing, especially for the mass media. It is an "interim" book -- part of continued teaching, research, and writing interest in applying theory and methods especially from the behavioral sciences -- in so-called communication skills instruction.

Television and Children

Aimee Leifer and Donald Roberts completed their study of the development of understanding of motivations, consequences, and aggression as portrayed in contemporary television programs, and the influence of these variables on subsequent aggressive behavior of children between the ages of 4 and 18 years. The research, conducted under a contract from the Surgeon General's Scientific Advisory Committee on Television and Social Behavior (National Institute for Mental Health) included construction and validation of dependent measures of understanding and aggression and four separate studies in which variables relevant to motivations and/or consequences were manipulated and understanding and aggression were measured.

A response hierarchy instrument was developed to measure the probability that children would use aggressive behavior to resolve interpersonal conflict. Based on extensive pilot interviewing of children
between the ages of 3 and 16 years, the instrument was comprised of six situations found to annoy children and four types of possible responses to each situation: physical aggression, verbal aggression, leaving the field, and positive coping with the irritant. All six possible pairs of responses were presented with each of the six annoying situations. Children chose the one behavior of each pair they thought they would be most likely to perform in the situation. Situations were presented verbally; responses were presented both verbally and in cartoon form.

Responses of 4-year-olds to this instrument were found to correspond well to actual aggressive behavior. Responses of fifth graders were found to correspond well to teacher ratings of the students aggressive behavior. Similar validation attempts with 13-year-olds provided inconclusive results, with little group difference found either in actual aggressive behavior or in predicted aggressive behavior on the response hierarchy instrument.

Following instrument development, the first major study tested understanding of motivations for and consequences of televised aggressive acts and subsequent aggressive tendencies among kindergarteners, third, sixth, ninth, and twelfth graders. Complete videotapes (including commercials) of two children's programs, two westerns, and two adult crime programs were used. Tests of children's understanding of the exact motivation for and consequence of the more salient violent actions in each program were constructed, using information gathered from adult viewers in communities surrounding Stanford. Evaluations of each character who participated in violence, motivations, immediate
consequences, and final consequences were also elicited. Understanding and evaluation tests were presented verbally and pictorially to kindergarteners, verbally and in written form to third graders, and in written form to all other children. Small groups of children viewed one of the programs, answered the understanding and evaluation questions, and then completed the response hierarchy instrument.

The second study examined the influence on children's subsequent aggression of videotapes constructed to present all aggressive acts as having either good or bad motivations and good or bad consequences. Regularly scheduled programs were videotaped and edited to 20 or 30 minutes in length to provide the following four stimuli: good motives and good consequences for all aggressive acts, good motives and bad consequences, bad motives and good consequences, and bad motives and bad consequences. A nonaggressive travelogue of similar length was also taped. Two to three weeks prior to viewing any videotape, children completed the response hierarchy instrument. After viewing one of the five programs, children again completed the response hierarchy instrument and then answered some comprehension items about the program they had seen. Preschoolers, fifth graders, and twelfth graders served as subjects.

In a third study, Nolan, a graduate student in the department, explored the relationship over age between portrayed justification for an aggressive display and the amount of subsequent aggression. He used a ten-minute segment of the prize fight scene from the movie "The Champion" (1949) with a professional announcer recording a description of the loser which would either justify or not the beating
he receives. Fourth, seventh, and tenth graders viewed one of the two videotapes, completed the response hierarchy instrument, and then answered some comprehension items about the justification for the aggression.

The fourth study was devised and carried out by Collins (now at the Institute for Child Development, University of Minnesota, Minneapolis) as his doctoral dissertation in the department. He examined the effects on understanding and aggression of varying the temporal separation between portrayals of aggression and the motivations for and consequences of it. A videotape of a current program was edited so that all aggression was unjustified and punished. Two strings of commercials, each consisting of four, one-minute commercials, were then inserted either near the beginning of the program to provide the low-temporal-separation tape or between motivation and aggression and between aggression and consequence to provide the high-temporal-separation tape. Two weeks before viewing either the tape or a non-aggressive travelogue, third, sixth, and tenth graders completed the response hierarchy instrument. After viewing one of the three programs, children completed either a questionnaire about the program or one about their leisure activities, and then they again completed the response hierarchy instrument with additional items presenting situations and responses specific to or similar to those presented in the aggressive program.

There was only minimal evidence from the four studies that motivations and consequences, as they are commonly depicted in television programs, modified the effects of exposure to the aggressive content of
of these programs. The validation experiment with four-year-olds did demonstrate that depiction of highly salient, repeated consequences for aggressive behavior would influence both play behavior and verbal reports of behavioral solutions to fairly common situations involving interpersonal conflict. Yet, the four studies described here which involved motivations and/or consequences for aggression, but in which the portrayal was considerably closer to that of contemporary television, manifested little evidence that the observed motivations for or consequences of aggression modified subsequent aggression by the viewer. Nor was there a clear developmental trend in the effects of exposure to aggression with different motivations and consequences, although children between the ages of three and 18 were studied.

Children as young as five apparently did not understand motivations and consequences as they were presented in current television programs. By about the third grade, they understood about half of the material they were tested on. From this age on there was steady improvement in understanding so that twelfth graders understood almost all content they were tested upon. Understanding did depend somewhat upon the specific program viewed, but it did not depend upon the type of program viewed (i.e., children's program, western, or adult crime program). Collins provided evidence that at least some of the lack of understanding of motivations and consequences in contemporary television may be due to the mass of information presented and the separation, both by time and additional, irrelevant content, of the primary content of motivation, action and consequence. All children, even as young as kindergarteners, apparently understood the evaluative content of a program when they understood the behavioral content.
Within the body of work conducted under this contract there were seven opportunities to examine the question of the effect of viewing television violence, apart from the effects of the motivations and consequences associated with it. In three of these, there was no apparent effect from exposure to violence, in two there was a slight increase in aggressiveness after exposure to aggression, in two there was a notable increase in aggressiveness after exposure to aggression, and in none was there either a slight or notable decrease in aggressiveness after exposure to aggression.

Participating in these studies were graduate students Collins, Nolan, Reginald McGhee, Bernadette Nelson, and L. Terri Silverman, and research assistants Henrietta Ferry and Judith Juncker.

Full reports of the work conducted by Leifer and Roberts and graduate students associated with the project may be found in the following publications:

Aimee Dorr Leifer and Donald F. Roberts. Children's responses to television violence. Institute for Communication Research, Stanford University, August, 1971.


Matilda Paisley, supported by Parker's NSF Communication and Public Policy grant, is doing a review of the National Institute for Mental Health Social Effects of Television project. The first section is a retrospective look at the events surrounding the Pastore resolution to create a Surgeon General's committee, the funding of individual projects, etc.
The second half includes a critical review of these projects with emphasis on their policy relevance rather than their theory relevance. The theme of the paper is that if social scientists are to provide information which is useful to decision-makers in government, their research must be policy-oriented. This new focus requires a rethinking of concepts, variables, and methodologies.

Communication and the Environment

During the year Coombs directed a national survey of membership for the Sierra Club, with special sub-sampling projects for the two large Sierra Club chapters in the San Francisco Bay Area. Information developed in the survey was used in reformatting and budgeting club publications and in planning strategy to gain new members and get present members more involved in conservation activity. The information seeking and communication preferences of members were investigated, and results emphasized the importance of interpersonal communication in conservation activities. Further studies were underway at year's end to compare the communication patterns of chapter leaders with those of the general membership, and to seek demographic predictors of leadership activity.

A 14-month study of mass media coverage of the environment was completed by a team of students from the Institute. The National Science Foundation study involved, at one time or another, 36 graduate students and was the first NSF project to be originated and conducted solely by students.
The principal investigators were David M. Rubin, who this year received his Ph.D. and David P. Sachs, a fifth-year medical student. One conclusion was that the "big picture" of environmental problems has been described well by mass media, but editors have failed to provide specific data needed by citizens to help solve these problems.

Three published volumes resulted from the study; one on environmental media coverage in the San Francisco metropolitan area and nationally, one containing a description of the San Francisco Bay Area water system and an analysis of the California Water Plan, and one offering an annotated bibliography of information sources on environmental subjects.

The project supported six doctoral and ten master's theses. Some of the topics covered were The Environmental Information Explosion, Eco-Activists and the News Media, Environmental Advertising and Social Responsibility, Covering the Nuclear Power Debate, and The Press and the Growth Establishment.
Dissertations in Progress

The following doctoral dissertations are among those underway or recently completed at the Institute:

Kent Anderson - Developmental Study of a Folk Communication System

Betsy Blackmer - Skill in Language: A Study of Information Processing in the Production of Speech

David Brill - Semantic Representation in Programs for Interpreting Natural Language Expressions (tentative title)

Trevor Brown - general topic of Financing Public Television

Jesse Caton - The User Interface in Large-Scale, Computer-Based Systems

W. Andrew Collins - Intra-presentation Factors in the Relationship Between Media Violence and Aggressive Behavior in Children

Douglas Hall - The Effect of Eye Movements on the Recall of Information with Visual Imagery

Susan Higley - The Effects of Insult, Aggressive Modeling, and Vicarious Reinforcement on the Administration of Punishment to Another Person

Robert Hornik - The Effect of Commercial and Instructional Television on Information Processing Abilities of Junior High School Students in El Salvador

Henry Ingle - A Developmental Attitude-Change Study: Children's Perceptions of the Computer as an Expert Source of Information (School of Education degree in educational communication)

David Jones - Newspaper Management and Community Influentials: An Analysis of News Performance in a Situation of Vested Interest


Gary Lawrence - Comparative Effects of the Paid Mass Media in Congressional Election Campaigns

David Markle - The Research and Development of First Aid Instruction for Functionally Illiterate Adults

Thomas Martin - general topic of Man-Machine Communication
John Mayo - Educational Reform and the Dilemma of Student Aspirations: The Case of El Salvador

Colin Mick - Information Seeking Style in Medicine

Bernadette Nelson - Effects of Race and Sex Role Stereotyping on Attention to and Acceptance of Occupational Role Models

Frank Allen Philpot - The San Francisco Broadcasting Market: An Examination of the Problem of "Quality" in Broadcasting

David Mark Rubin - Reporting the Corporate State: Adversarity, Freedom of Information, Public Utilities, and the Press

David Sachsman - Public Relations Influence on Environmental Coverage in the San Francisco Bay Area

Peter Sandman - Eco-Pornography: Environmental Advertising Acceptance in the San Francisco Bay Area

Peter D. Shapiro - Networking in Cable Television: Present and Future Alternatives

Drury Sherrod - Self Perception and Attribution in Social Interaction

Judy Strasser - general topic of Cable Television

Some Publications Since the Last Report

In addition to titles mentioned earlier in this report, the following have appeared or gone to press since the last annual report.

Books and Monographs


Articles and Papers


Privacy is Not the Issue, by Krieger, Department of Communication, July, 1971.

Through the Looking Glass (Women and the Mass Media), by Leifer, paper presented publicly at Sacramento City College, Sacramento, California, April, 1971.

Bringing Up Children With Television, by Leifer, paper presented as keynote speaker at Annual Leadership Conference of Peninsula Parent Participation Nursery Schools, San Jose, California, October, 1971.


New Book and Pamphlet Publications

These books, one year booklets or written to the publisher:

Communication in the Home of Our Children (Schramm, Lyle, Parker). Stanford University Press, $5.95 cloth; $2.95 paper.


For Professional and General Readers. Beacon Press, $4.95.

Communication and Change in the Developing Countries (Lerner and Schramm). East-West Center Press, Honolulu, $9.50.
The Supreme Court and the News Media (Grey). Northwestern University Press, $5.95.


The following documents may be ordered by ED number from the ERIC Document Reproduction Service, P. O. Drawer 0, Bethesda, Maryland 20014. The documents are available in both microfiche (4 by 6 inch sheets of microfilm on which up to 70 pages of text can be reproduced) and hardcopy.

The People Look at Educational Television (Schramm, Lyle, Pool).
ED 003 148; 65¢ microfiche, $9.87 hardcopy.

Learning from Television: What the Research Says (Chu and Schramm). ED 014 900; 65¢ microfiche, $9.87 hardcopy.

New Teaching Aids for the American Classroom (Schramm).
ED 003 146; 65¢ microfiche, $6.58 hardcopy.

Educational Television: The Next Ten Years (Schramm).
ED 003 729; 65¢ microfiche, $13.16 hardcopy.

The Research on Programmed Instruction: An Annotated Bibliography (Schramm, ed.) ED 003 800; 65¢ microfiche, $6.58 hardcopy.

Four Case Studies of Programmed Instruction (Schramm).
ED 003 804; 65¢ microfiche, $6.58 hardcopy.

The Influence of Television on Children and Adolescents (Schramm).
ED 017 197; 65¢ microfiche, $3.29 hardcopy.


A limited number of the following is available from the Institute, for a nominal handling charge:

Bibliographic Citations as Unobtrusive Measures of Scientific Communication (Parker).

Criteria for the Production and Selection of Film for the Classroom: A Preliminary Study (Maccoby, Jecker, and Breitrose).

Scientific Information at an Interdisciplinary Behavioral Science Convention (Parker, Paisley).

Communication and Learning (Paper presented by Maccoby at International Communication Association Symposium at Western Speech Association Meetings, San Diego, California), November 25, 1969.

The Role of Television in Literacy Programs (Paper written by Maccoby and others for the Committee on Reading, National Academy on Education, and presented at a Committee meeting in New York City) June, 1970.


"Feedback" for Instructional Television. Research Memorandum No. 3, (Schramm).

A General Mathematical Model of Information Diffusion (Funkhouser).

Idiosyncratic Verbal Behavior of Interviewers (Collins).

Communicating Science to Nonscientists - Phase I and Phase II (Funkhouser and Maccoby).

For the following documents, write the International Institute for Educational Planning, 7 rue Eugene-Delacroix, Paris 16, France. They are also available from the UNESCO Publications Center, 317 East 34th Street, New York, New York, 10016:

The New Media: Memo to Educational Planners (Schramm, P. Coombs, F. Kahnert, Lyle).

The New Media in Action: Case Studies, Volumes I, II, III.

A limited number of selected Peace Corps reports on the ETV Program in Colombia is still available from the ERIC Document Reproduction Service.
Personnel and Organization

The Institute for Communication Research is a division of the Department of Communication, of which the chairman is Lyle Nelson. The Department also includes divisions responsible for training in journalism, broadcasting, and film, and mid-career training for professional journalists. It offers a B.A., M.A. and Ph.D. in Mass Communication Research and Public Affairs Communication. The teaching in the Ph.D. sequence is done mostly by members of the Institute and members of the related faculties, and research experience required for the degree is gained in the Institute. A brochure about the Institute, outlining what it is and what it does, is available on request.

Members of the senior Institute staff include Wilbur Schramm, the director; Henry Breitrose, Nathan Maccoby, Lyle Nelson, William Paisley, Edwin Parker, and William Rivers.

Junior staff and study directors this year were Don Coombs (ERIC director), Cedric Clark, G. Ray Funkhouser, David Grey, Aimee Leifer, Emile McAnany, John Mayo, Colin Mick, Matilda Rees Paisley, Donald F. Roberts, Edward J. Sondik, Judy Spellman, and Jan Voelker.

Among research assistants were: Kent Anderson, Betsy Blackmer, Janice Bleil, David Brill, Jesse Caton, Carolyn Clark, W. Andrew Collins, Paul Cowan, Jon Else, Dennis Foote, Michel Guité, Robert Hawkins, Suzanne Hawkins, Susan Higley, Robert Hornik, Henry Ingle, Judy Juncker, Steven Klees, Richard Kletter, Alice Kraeger, Osvaldo Kreimer, John Kroll, Bruce McKay, Tom Martin,

Staff members sharing in ERIC Clearinghouse activities included: Jaclyn Caselli, JoAnn George, Kerwin Lee, Violet Lofgren, Theresa Purcell, Maxine Sitts, Michele Timbie, Geraldine Van Sooy, and Judy Yarborough.

Those on the secretarial staff were Hester Berson, Carolyn Collins, Libby Jenkins, Jan Matthews, Linda Miller, and Ellen Wilson.
Annex B

SOURCES RELATED TO TABLES APPEARING IN PART II
EL SALVADOR

REFERENCES


