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Informal Channels of Communication In the Behavioral Sciences: Their Relevance In the Structuring of Formal or Bibliographic Communication

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During the past four years we have been involved in a broad study of scientific communication in psychology, and we are immensely impressed by the wide range of activities which a scientist will undertake in trying to discover every available means of obtaining information on new, ongoing, or recently completed work relevant to his own. The scientist who wants contemporary findings to plan research or to interpret his own findings is not willing to wait for formal dissemination of research findings. It seems quite clear that the increasing reliance on informal communication is the scientist's way of adjusting to the "information explosion" and satisfying those information needs which formal channels do not or cannot fulfill. The traditional (formal) communication system, consisting of journals, abstracts, and reviews, has glaring

deficiencies as a source of information about current research activities. It is equally evident that the auxiliary (informal) systems that have sprung up in response to these defects are enormously costly in money and time. Moreover, with the continued growth of science it will shortly be necessary to draw a sharp distinction between the needs for rapid communication and those for archival storage, since present findings indicate that some elements in the system may serve neither function well because they are trying to serve both.

Recently the data of the Project on Scientific Information Exchange in Psychology have been examined with a view to trying to understand the following: What are the needs being served by informal communication? What can be done about giving informal communication, without destroying its function for the active researcher, certain of the advantages of formal communication, such as, general accessibility, permanence, etc.? How can formal channels be manipulated to take on the characteristics of informal communication? To cast light on these questions, the present paper examines the role of informal and formal channels within the overall system of scientific dissemination in psychology, considers the special advantages of informal communication, and outlines certain relations between informal and formal channels. In a final section of the paper, two experiments in scientific communication are described; one experiment being built about an innovation that attempts to "informalize" formal channels while the other is built about another innovation that, in general, attempts to "formalize" an informal channel.

Informal and Formal Channels Within the Overall System for Scientific Dissemination

The overall system for dissemination of scientific information in psychology has been described on the basis of a series of studies which were designed to encompass the full spectrum of communication, rather than focusing on a limited set of media or functions. The results of this effort are shown in Figure 1 which depicts the elements of the system of dissemination in relation to the activities of the investigator. Since detailed findings on the operation of the system have been published,[1] the present report examines only those data that point to the contrasting roles of informal and formal channels in the system. The schema in Figure 1 shows the dissemination of the contents of a typical journal article. All events are referred to a time scale, at the far left, which relates the average time of each event to the date of journal publication.

[1] Garvey, W. D. and Griffith, B. C., "Scientific Information Exchange in Psychology," *Science*, 1964, 146 (1655-1659).

The vertical line, in the center of the slide, indicates some of the important stages in the investigator's work: the work on the average starting some 30-36 months prior to publication, the work reaching a stage at which an informal report would be made of the results, some 20 months prior to publication, and an article, based on the work, being submitted to the journal six to nine months prior to publication. The rectangles to the right of the center contain the various types of oral presentation; the rectangles to the left contain the various written forms in which the contents may appear; and the rectangles at the far left contain listings and forms of secondary publications. The white area contains forms of *formal* communication—they are genuinely public and in permanent storage. Whereas, the larger shaded area contains informal channels that are available only to restricted audiences on a temporary basis.

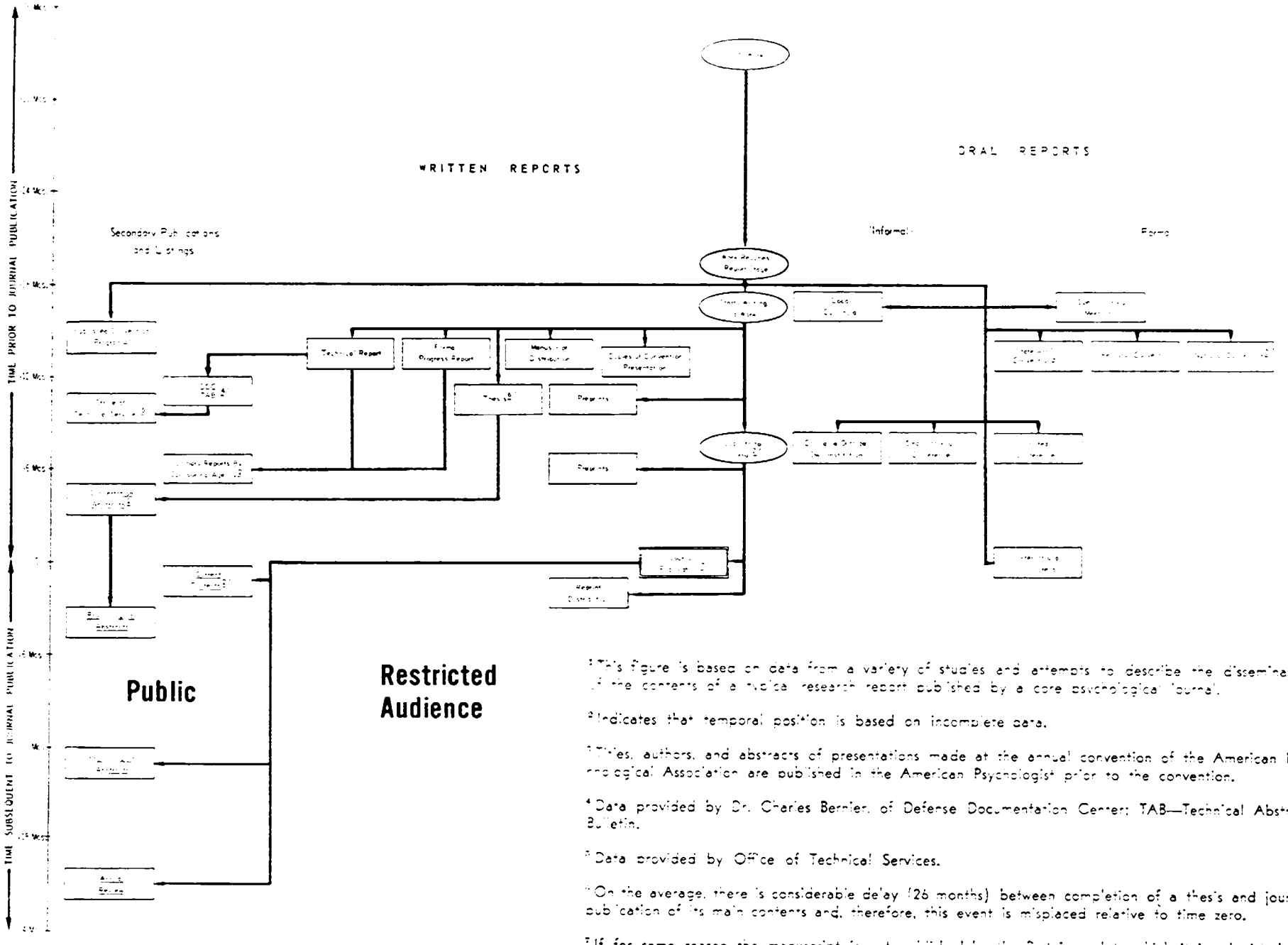
There is a sharp contrast between the roles of formal and informal channels in the system. The *public formal* dissemination of information occurs late in the system, takes only a few forms, and in its complete archival presentation, that is, in scientific journals, has relatively small immediate use made of it. On the other hand, the system includes a great variety of *informal* means of scientific communication. While the audiences for some of these are small, others are quite large and a research worker may find an audience which equals or exceeds the number of persons who examine articles shortly after publication. Furthermore, there is evidence that most productive researchers, at least those in major institutions, are reasonably well-informed concerning the activities in their own special fields. Thus, there is considerable redundancy in the informal system (i.e., information from a single study appears in a variety of forms), and as a result, there are relatively few highly interested persons who are eagerly awaiting archival publication of any particular set of findings. Yet, it is clear that in order to maintain this state of current awareness scientists are relying heavily upon makeshift systems which have sprung up quite spontaneously and without design relative to their effects on other elements in the system.

Functional Characteristics of Informal Channels

Formal and informal channels can be generally differentiated in terms of two gross characteristics of their products: *Formal channels* carry information which is public and remains in "permanent" storage; *informal channels* carry information to restricted audiences and its storage is relatively temporary. This section adds a further distinction by turning to some of the functional characteristics of informal channels which seem to distinguish them from formal channels. It should be kept

FIGURE 1

THE DISSEMINATION OF SCIENTIFIC INFORMATION IN PSYCHOLOGY



[1] This figure is based on data from a variety of studies and attempts to describe the dissemination of the contents of a typical research report published by a core psychological journal.

[2] Indicates that temporal position is based on incomplete data.

[3] Titles, authors, and abstracts of presentations made at the annual convention of the American Psychological Association are published in the American Psychologist prior to the convention.

[4] Data provided by Dr. Charles Bernier, of Defense Documentation Center; TAB—Technical Abstract Bulletin.

[5] Data provided by Office of Technical Services.

[6] On the average, there is considerable delay (26 months) between completion of a thesis and journal publication of its main contents and, therefore, this event is misplaced relative to time zero.

[7] If for some reason the manuscript is not published by the first journal to which it is submitted, an additional delay of approximately one year is incurred before journal publication.

in mind that all informal channels may not have all these attributes; the important points are that they are usually not characteristic of the *formal* channels and these functional attributes should be understood so that they are not destroyed through attempts to create innovations to facilitate scientific communication.

The most obvious characteristic of information disseminated via informal communication channels is that it is *current*. Figure 1 shows that work published in a typical journal article reaches a stage at which the author could make a rather complete report of it about 18 months prior to its publication, but that the variety of informal reports take place very shortly after the work reaches this reportable stage. The information disseminated through some of these early informal channels reaches audiences which contain a large proportion of active researchers involved in work in the same area, i.e., a large number of active researchers who are potential users of this information will tap one or more of these outlets.

It is interesting to note that a good deal of the most basic informal communication, two scientists talking face to face, does not even wait for the work to reach this special "report stage" at which a rather complete report of the work could be made. It is apparently not uncommon for the scientist, enthusiastic about his discovery, to run out of his laboratory, and corner the first available colleague to tell him of what he thinks he has discovered. Much correspondence, discussions over lunch, bull sessions at bars, etc., would seem to evolve around this type of information exchange. As unstructured and limited as this form of communication may be, it is the very early beginning of a spreading of the news about a research finding.

A second prominent feature of informal communication is that it contains a considerable degree of *redundancy* and of selective dissemination of information in different forms. Much of the same information will appear in a variety of forms, and many of the same people receive equivalent forms of the same information. To give some notion of the magnitude of such redundancy, the contents of half of a sample of articles published in APA journals had been reported in at least one oral form prior to publication; forty per cent, in at least one written form. Furthermore, a third of those articles which received *some* form of prior report were disseminated in two or more forms. *Such redundancy is not, however, necessarily mere duplication of content.* In a study in which we made a comparison of presumed usefulness of the "same" work reported in technical reports and journal articles to persons planning to conduct work relevant to that reported we found that one out of three technical reports was a more detailed and complete presentation

of the material and would be more useful than the journal article to persons interested in replicating or extending the work. Seven per cent of reports and articles compared were too different in objectives and/or expression of content to be comparable on the basis of usefulness.

Technical reports, manuscript distribution, preprints exchange, reports to special group meetings, to invited conferences, to small informal conferences, etc., are only some of the media which authors use to reach those scientists for which the information reported has great relevance and meaning. Clearly, many of these informal channels have different and very specialized audiences, and repeated presentation of the same basic information may be shaped and reshaped by the author to fulfill the special needs of particular audiences.

Third, *relevancy* of information is more easily established via informal channels. Because of the difference in language, or the different fields of endeavor within a science, formal communication is not an efficient means to provide the necessary information for determining the relevancy of others' work to one's own. Informal communication, on the other hand, allows for rapid interaction; a scientist will quickly seek to establish that he and his colleague are speaking of the same problems, the same variables, and the same concepts. The potential extensive scope, in terms of subject matter and degree of complexity of information "readily" available through informal interaction, combined with the high likelihood of ascertaining relevance through quick feedback provide for more rapid solution of a wide variety of research difficulties by informal interaction between scientists. Because of this characteristic, a large part of informal communication seems to result from *formal* communication through the scientist attempting to ascertain the relevance of the formal communication to his own work.

Fourth, informal communication is more *"openended."* Scientists interacting informally are willing to speculate about their work, to discuss their mistakes as well as their successes, to range over a broad area of interests, which in a more rigorous framework may appear only tangential to their specific findings. Formal communication, for a variety of reasons, is more stereotyped and allows for less freewheeling and speculation.

The formal statements of ideas, hypotheses, etc., and pertinancy in presentation have some distinct advantages for science. But a common criticism of formal communication is that the gist of the work has been "formalized" out of it by the time it appears in print or is given from the podium. The scientist's way of thinking, his goals, style, etc., are not particularly amenable to most formal media, and the special significance and the brilliance of a scientist's research often appears in

the preliminary stages of his work—long before he has the opportunity to formalize it. An analogy exists in art and may help to explain this point.

The essence of an artist's work often appears in his informal sketches years before he formalizes it on canvas. The history of art is replete with examples of such very early appearances of that style which distinguishes an artist's work from the art of the past. Furthermore, even after the formal canvases have been produced, the artist's style (i.e., what he is trying to say) may be more abundantly apparent in his early preliminary work sketches.

The "art" in a scientist's research, a real feeling for what he is personally trying to do, is often communicated to small groups—in seminars, through correspondence, bull sessions, etc. Unless one is a member of one of these intimate groups he may never have an understanding of the underlying importance of a lifetime of scientific endeavor until the great scientist gets around to writing his "book." A typical reaction encountered is that one is never *fully* aware of what a scientist has been up to until he makes his "presidential address."

Fifth, informal channels allow the scientist to *direct* the communication and *select* for himself the specific information he needs. For each researcher there are some specific information needs; he may not always be able to articulate them, but he usually can recognize them when they are satisfied. These needs, which change from time to time, are determined by the subject matter of his research; his own mode of working, his attitudes toward communicating his own work, the stage of his research, etc. In most formal channels it is not possible to shape a communication to fit everyone's needs.

In addition, the scientist uses informal contacts to proceed self-selectively through the dissemination network to acquire needed information. That is, informal channels allow him to *shape* and *direct* not only a particular communication but also his own research behavior. In this activity he is trying to do two things. First, he is trying to select from a particular source enough information to decide whether further pursuit is likely to provide him with fruitful information, and second, he seeks to channel further pursuit in the direction which will enable him to obtain the most information with the least noise in the quickest manner and with the least effort. Thus, he attempts to acquire enough information to make the decision of where to proceed next in the network.

Sixth, informal channels enable the scientist to obtain reinforcing and *critical feedback* which he may desire to satisfy his own uncertainty about some aspect of his scientific behavior. Scientists, as a lot, are not

necessarily insecure personalities, but it does appear that part of the scientific attitude is a determined effort to seek critical evaluation of scientific work before it has a chance to become public. This effort on the part of scientists to obtain evaluative feedback is frequently encountered in informal communication, and some of the more frequent examples are: testing the communicability and intelligibility of one's ideas; formulating and substantiating, through argument and discussion, one's theories and ideas; getting encouragement in the pursuit of a certain type of research; obtaining a perspective, through communicating with persons representing other points of view, by means of which to evaluate one's own efforts and shortcomings; exploring new approaches to various problems and new areas in need of investigation; and establishing one's priority in an effort.

The stimulating, facilitating, and encouraging aspects of informal communication in relation to research are probably more important than they have been considered. A typical reaction we have encountered is that interest expressed by a colleague is encouragement for a person to go ahead with it. When such interest or encouragement was not manifested there was a tendency to delay, if not abandon, the beginning of research.

There are some other characteristics of informal communication which are less relevant to the present discussion which has been built about the function of such communication in facilitating research. In some instances informal channels are purely means for a scientist to satisfy his desire to disseminate; the communication of information to satisfy the needs of other scientists is apparently secondary. Scientists use informal channels to establish the priority of their findings; to disseminate their findings when they cannot get them published; to fulfill contract obligations, to build up their bibliographies, etc. These dissemination needs are significant in the operation of scientific communication, but serve no function in the facilitation of research or the enhancement of the *reciprocal exchange* of scientific information.

The Relation Between Informal and Formal Channels of Communication

Having discussed some of the more prominent functional attributes of informal communication which distinguish it from formal communication, there seems little question that these communication functions are fundamental to the progress of science, and that any attempts at formalizing scientific communication must seek at the same time to preserve them. There are emerging from the Project's studies some general principles regarding the relationship between formal and informal communication which would seem to have implications for the information specialist in his efforts to enhance scientific information exchange.

First, informal communication channels are created and perpetuated by the scientists themselves to satisfy information needs which are not being fulfilled by formal channels. The multiplicity of forms of communication, most of which have been informally created by scientists, testifies to the scientists' ingenuity and drive in this respect.

Second, "formalization" seems to be the natural step taken to adjust to the growth of an informal institution. For example informal groups which initially hold their own private (unscheduled) informal gatherings during the same time as the large annual convention attract new members into the "invisible college" with each passing meeting. At some time these meetings reach a stage where their informal atmosphere can no longer be maintained. To prevent chaos, formalization creeps in and these informal gatherings take on some of the attributes of the highly structured paper sessions at the larger conventions. For example, participants may be required to limit their presentations to a brief time, to distribute copies of their presentations prior to the meetings, etc. When this stage is reached the informal meetings acquire most of the disadvantages but lack many of the advantages associated with large meetings. The next natural step is for the group to affiliate with the APA and become a division with formally scheduled sessions at the major convention.

Third, the more formalized a channel becomes, the fewer the functions of informal communication it can maintain. Gradually, through formalization the ability of an informal channel to satisfy information needs for which it was created diminishes. When an informal channel becomes unsuccessful in this respect it atrophies through lack of use. There would appear to be no unsuccessful informal channels in operation. By the same token, there appear to be no formal channels which are completely successful information exchange media without their being supplemented by informal channels.

Fourth, informal channels are unstable and temporary compared to formal channels. Not only is there a tendency for formal institutions to take over informal channels, but the latter also are often only temporary, auxiliary outlets to relieve the burden on a formal channel. An increase in the submission of manuscripts for journal publication produces an increase in publication lag. When the lag becomes too great, informal preprint exchange groups for special, rapidly growing areas may be organized. Such groups will exist until special journals are formed to publish these articles. At this time the publication burden on appropriate journals is reduced and publication lag is momentarily shortened. At this point, the preprint-exchange group would have no function and would be likely to dissolve.

Fifth, formal channels have two major characteristics which lead

to their being considered the final outlet for scientific findings; they provide permanent and public record. Since informal channels do not have these advantages, most scientists are not satisfied with the dissemination of their findings, no matter how many informal channels have conveyed them, until these findings have been reported via one or more formal channels. The tendency on the part of most scientists to regard the journal as the major or ultimate type of dissemination of their research is one of the major factors which sustains the present system of dissemination of scientific information in psychology.

Two Studies of Innovations in Scientific Communication

The present state of affairs in scientific communication in psychology appears, on the surface, to be complicated, unruly, and an insolvable mess. But, we believe in our study of scientific information exchange, we are beginning to see order in the overall system. It is evident that the elements in the system, both formal and informal, are dynamically related; that is, changes occurring in one element affect, in some way and to some extent, the operation of other elements in the system. By understanding something about the operation of these elements and their dynamic relationship, one should be able to *formalize* informal channels and *informalize* formal channels without damaging either.

Informalizing the formal: The scientific journal appears on the surface to be a difficult formal medium on which to graft the attributes of informal communication without adding to the "information explosion." For example, providing for longer articles, establishing new more discursive journals, reducing the publication lag by publishing more articles, etc., would presumably add to the problem. On the other hand, there appear to be ways of using the formal attributes of the journal to facilitate informal exchange.

In our first attempt to do this we selected four APA journals which have long publication lags and collected the backlog of their accepted manuscripts. Beginning with the first issues of the 1965 volumes of the journals, we published in each journal a listing of the titles of these manuscripts, the names of the authors and an address of the author who was corresponding with the editor.

By publishing these listings, the journal could take on some of the functions provided by informal channels. The main functional characteristics of informal channels which concerned us in this effort were recency and redundancy. Information about completed research would be disseminated nine to twelve months prior to its publication in a journal article, and the published announcement would provide others

in related work with a very public and accessible means of becoming aware of current efforts or findings. Once established and accepted, we hoped that this innovation would acquire even more attributes of informal communication.

This study is still in progress but there are enough data available to give some indication about how the innovation is working. We shall go into these data in some detail in order to give some notion about our methodology in measuring the effect of such innovations. The study consists of a series of surveys which are conducted periodically in synchronization with the first listing of an author's article, with the authors' receipt of requests for copies of their manuscripts, with the distribution of copies of manuscripts to the requestors, and with the receipt of the copies of the reports of research by the requestors.

First, let us look in Table I at the authors' *earlier work in the same area* as that reported in their manuscripts. Eighty-three per cent of the authors reported that they had been involved in one or more of the activities listed in this table. It is evident that the authors have been highly active in disseminating information on previous work which they have done in the same area as that reported in their manuscripts; 63% had published one or more articles in the same area. Thus, other researchers interested in the same subject-matter have had an opportunity to be alerted about the author's past work in the area.

TABLE I

Activities of Authors in Same Subject-Matter Areas as that Reported in Their Manuscripts

Activity	*Percentage N = 354*
Wrote thesis or dissertation in area	31%
Published one or more journal articles in area	63
Published chapter of book in area	9
Published book in area	4
Published technical reports or other research reports that are distributed on some systematic basis	17
Made oral presentation in same area at regional or national meetings	44
Other	18

Now let us look at the prior dissemination of the "same" work reported in the manuscripts. Table II shows the other forms in which the main contents of the manuscripts appeared prior to their acceptance for journal publication. Seventy per cent of the authors had re-

TABLE II

Dissemination of Information Prior to Acceptance for Journal Publication

In Written Form	*Percentage N = 354*
In at least one form	43%
A book or part of a book	2
A dissertation or thesis	19
A technical report	11
A progress report	10
Other	8
In Oral Form	
At the APA annual meetings	10
On at least one occasion	53%
A paper given:	
At the Psychonomic Society meetings	6
At a regional or state convention	13
At other national conventions	4
At an invited conference	6
At a colloquium within your employing organization	12
At a colloquium outside your institution	13
At a thesis committee meeting	7
Other	6

ported the main contents of their manuscripts prior to acceptance; 43% in a prior written form and 53% in an oral form. Over a quarter of the authors had made reports of the work in both forms. (Furthermore, we found that 56% of the authors had distributed preprints, prior to the listing of acceptance of the manuscripts in the journal.) Some of these outlets do not command large immediate audiences; nevertheless the majority of the research has had ample opportunity to get into the informal network.

Not only have these authors been active in the past, but they are continuing to be actively involved in work in the same area as that reported in their manuscripts. Table III presents data relative to the authors' current and planned activities in the same area as their manuscripts. Seventy-five per cent are presently involved in some form of work in the same area; 44% are planning to become involved. Sixty-five per cent are presently conducting research; 23% are in the process of planning to do so. Over half are involved in supervising research. It is significant that over half of these authors are *in the process* of pro-

TABLE III

Authors' Other Activities in Same Area as That of the Work Reported in Their Manuscripts
N=124

Activity in Same Area *as that of Work Reported in Listed Manuscript*	*Percentage Presently Involved In*	*Percentage Planning to Become Involved In*
Involved in at least one activity listed below	75%	44%
Conducting research	65	23
Teaching course	35	15
Supervising research (including theses)	47	15
Conducting applied work	8	3
Preparing a presentation for a regional or national meeting	17	10
Preparing a manuscript for journal publication	44	19
Preparing own thesis or dissertation	3	1
Other	3	1

ducing another article based upon work in the same area; 44% have already started preparing manuscripts for journal publication.

As a group, these authors are obviously fertile sources of scientific information; they have been active in the past, they widely disseminate their research findings, they are currently very actively involved in the area, and they plan to continue producing in the area. There would seem to be great potential advantages to establishing informal communication channels with these scientists.

Now let us turn to the other end of the exchange and see what sort of response was made to the listings. Ninety-one per cent of the authors received inquiries about their manuscripts as a result of the listings. The average number of inquiries received was four with a range from one to 24. Almost every inquiry constituted a request for a copy of the manuscript or some report of the research contained in the manuscript. Three quarters of the requestors received copies of the manuscript. (It would appear that a large proportion of those who did not will ultimately receive another form of a report of the information contained in the manuscript; e.g., technical reports, abstracts of manuscripts, library-loan copies of theses and dissertations, etc.)

These data leave little doubt that this innovation is used. We are, however, more interested in the functions it serves as a new element in the overall system of scientific information exchange in psychology.

First of all, it performed more of an alerting function than we

expected. Eighty-seven per cent of the persons who contacted authors were *first* aware of the existence of the work reported in the article through its announcement in the listings of accepted manuscripts. Even though 20% of the requestors were familiar with previous work of the authors of the requested manuscripts, only four per cent reported that they had either heard or read a report of the research described in the present manuscripts. This listing of manuscripts accepted in a journal is, however, the first *public* announcement of about three quarters of the work being listed, and large numbers of scientists may first become aware of the research through this element.

The requestors as a group do not appear to be presently "visible" enough to be among those who are spontaneously included in the informal network. The data on the requestors' scientific activities lend support to this conjecture. First, almost a quarter of them were spending some portion of their time studying for an advanced degree. Second, whereas all the authors had in the past conducted research in the area, only four out of ten of the requestors had been so involved. Third, the requestors had not been productive disseminators of scientific information in the area—only about one in ten had published an article and one in 15 had made a presentation at a regional or national convention.

Even though the requestors had been relatively less active in the past, they tended to be more actively involved in present work and in planning future work in the area. They seem to be using the listings not only to obtain current information relevant to their ongoing or planned research but also as a means of establishing their identity in the area and of trying to get into the informal network. Table IV may give some indication of the requestors' pursuits in this direction. Over half (54%) of the requestors who received copies of the manuscripts, and who had had an opportunity to read the report by the time of the survey either had or were planning to pursue additional interactions with the authors. Note that 36% of the requestors took a direct approach to tie in on the network by requesting reports of the authors' future work. Twenty-five per cent of the requestors may have attempted this indirectly by acquainting the authors with their own work.

In general, the types of contacts described in this table reflect communication activities which are characteristic of informal communication. With little stretching of the data these activities may be interpreted as communication efforts to determine relevancy, to proceed through the system self-selectively, to "openend" the network, and to obtain reinforcing and critical feedback. With regard to the latter, we feel that it is significant that *15%* of these scientists sought to obtain reactions to their own work.

TABLE IV

Requestors' Interactions With the Authors in Addition to Requesting Copies of the Report of Research

Types of Contacts Which Had Occurred or Were Planned at Time of Survey	*Percentage N = 253*[a]
Request reports of his future work	36%
Acquaint him with your work in area	25
Clarification on some point in the reported research	11
Request information not in report	15
Obtain reaction to your own work	15
Acquaint him with others' work in area	4
Other	6

[a] Number of respondents who had received a copy of a report of the research and who had had an opportunity to read the report at the time of the survey.

Although the study is not complete, and at this stage there is the problem of the novelty of the listings wearing off, we are confident that we have introduced into the system by means of a formal channel an element which is operating with some functional characteristics of informal communication.

Formalizing the informal. Over the past 20 years or so the large national scientific convention has become more and more structured and at the same time has struggled to serve the functions of an informal communication channel. Since the convention is viewed by the scientist to be an informal institution, it is also considered by many to be failing as a scientific information-exchange medium.

There is no question, however, that the convention serves an important function in the overall system of scientific communication and that it is very closely related to many of the fundamental elements in the system.

Over 500 scientific papers are presented at the annual APA convention. However the sessions at which these papers are presented have become ceremonial events: the participant is required to have completed the work he reports at least six months prior to the convention, the time allotted for presentation (usually about ten minutes) permits for only an abbreviated exposition of the research, and only a few minutes are allowed for interactions with the audience. The fact that the present paper sessions are not fulfilling the information-exchange needs of scientists is borne out by data we have collected on scientific communication surrounding convention presentations. In one study we found that 99% of the participants received requests for copies of their papers; the

median number of requests received was 13. (About three quarters of the requestors never attended the session at which the paper was presented.) Three quarters of the participants were sought out by attendants with whom there was a discussion of the contents of their papers. Time does not permit going into detail about the informal communication surrounding a convention presentation. (A Project report[2] describing some of these activities has been published.) The modifications which scientists make in their ongoing and planned scientific activities as a result of these informal exchanges are rather impressive.

A major problem relative to the scientific convention is one of determining how to formalize some of its information exchange activities so that the meetings will take on more of the attributes of informal communication.

In the fall of 1964 we started a study designed to enhance this informal communication at the 1965 convention and to measure its effects. The new element which we are introducing at this convention is a preconvention publication of those papers which will be presented at the sessions of five of APA's most important divisions—important in the sense that they contribute approximately half the scientific papers presented at the convention.

The published papers are limited to approximately 1800 words in length (including figures, graphs, references, etc.) (Eighteen hundred words is about the length of the paper that the participant would read at a session.) The published volume was distributed to all members of the five divisions and to the libraries of approximately 300 institutions; a limited number of copies are for sale. In addition 100 reprints were distributed to the authors of each of the papers. The published papers should be in the hands of recipients a month prior to the convention.

Since we have yet to collect our data, we cannot report the effects this innovation will have on scientific communication relating to papers read at the convention; however, we can point out some of the more important effects which may be expected to result from the introduction of this formal element.

First, the make-up of the audience is likely to change. In a study of a recent APA convention we found that two thirds of the audience were "passive" attendants in the sense that they had no communication, either written or oral, with the authors of the presentations they heard. Less than one in five of these attendants had ever done any previous

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[2] American Psychological Association Project on Scientific Information Exchange in Psychology, "Theoretical and Methodological Considerations in Undertaking Innovations in Scientific Information Exchange." PSIEP Report #12, January 1965.

work in the area of the presentation and only two out of five were either involved at the time or were planning to become involved. A good guess as to why many of these persons were attending the session is that they were trying to find out if the presentation had any relevance to their own work. Since the published papers give a better idea of content than titles or abstracts, the audience will more likely be composed of persons actually concerned with or involved in the work. Discussions of scientific value seem to result from "homogeneous" gatherings of persons of very similar involvement and interest.

Operating on the assumption that the majority of his audience will have read his paper, the author can be less restricted in his oral presentation. He may report additional data or give more explicit details about what he was attempting to do in the reported work or even what he currently is planning to do as follow up. The sessions should take on more the tone of a discussion; attendants will select aspects of the work of particular interest to them and seek its relevance to their work. There may be open interchanges between authors and attendants whereby each can discover new sources of research of relevance to their own work. In effect, the paper sessions may regain the functional characteristics associated with informal channels.

Some Conclusions on the Relevance of Informal Communication For Formal and Bibliographical Communication

In this paper we have attempted to demonstrate the important role which informal communication plays in scientific information exchange. We have discussed some of the more prominent features of informal channels and presented some general principles regarding the relationship between formal and informal communication. Finally, we have described how we have set about applying these principles in an effort to facilitate scientific information exchange. Now we would like to add something about the relevance of informal communication to the structure of formal and bibliographic communication in the future.

The emphasis in our work has been on the dissemination of scientific information for the scientist actively involved in *scientific research.* There are obviously other demands for the dissemination of scientific information—dissemination for technology, for teaching, for the use of students, and for disciplines outside the scientific domain such as history, politics, etc. (Each of these attributes and areas probably requires special dissemination systems, since a general system would serve none of these functions adequately if it attempted to serve all concomitantly.) However important these other functions may be, there seems to be an implicit assumption that the basic one is that of disseminating scien-

tific information for scientific research. In *this* process it is becoming increasingly clear that informal communication is already the master of the situation. In the present state of affairs, in which the scientific front moves so rapidly, the archival publication is likely to be two or three stages behind current scientific facts in "hot" areas of research.

The data are beginning to speak. The time has arrived to make the hypothesis that the present-day scientific journal article is *not* essential to the dissemination of findings for *scientific research.* If, in the next five years, this hypothesis has not been proven false, by overwhelming evidence, then it should be accepted and the information specialist must begin the difficult task of reorganizing formal and bibliographic communication to conform more appropriately to the scientific information requirements of the modern research scientist.

Oral Comments on Garvey & Griffith's "Informal Channels of Communication in the Behavioral Sciences," July 29, 1965

Response

ALFRED DE GRAZIA

Editor, American Behavioral Scientist

I have been asked to give informal comments on an informal communication, about informal communications. I must say that this is the most significant research that I've seen in the field of scientific communications. I have felt for several years that it would be, and I've watched with some concern and anxiety the progress of the psychologists in leading the way in this area. It is unfortunate that other kinds of social scientists have not been so forward.

The present concern is part of a much larger problem of scientific communication that stretches off into the natural sciences. These sciences are perhaps worse off. They may have better superficial retrieval devices but they are also very much burdened with hierarchies, establishments, and various limitations of a structural sort that the social sciences avoid simply because nobody has figured out how to control social scientists as well as the natural scientists control their own through such means as their more strict vocabulary and precise hypotheses.

So I wish to make quite clear my wholehearted support of the research and my anticipation of future volumes, which I shall read with all the abandon of a new James Bond thriller.

I might say that I wasn't too happy with the distinction that was made between the *formal* and *informal*. I thought it was a fairly *formal* distinction. I would have preferred a distinction made in terms of sanctions; that is, where rewards or punishments for a communication are great enough, it becomes a *formal* communication. Or where people subjectively perceive that they are doing something important, or more important, then it becomes a formal communication. Perhaps a more subjective definition like that could be added to the present, structured definition.

I wonder, too, whether there might not be some hidden values in the rather conventional acceptance of the term "functionalism," which causes so much trouble in social linguistics. I believe in functional analysis and all that goes with it. However, very often, there are *presumed* motives and goals included in what purports to be an *objective* functional, or neutral functional analysis, and then other kinds of functions are left out because they "should not" be mentioned. For example, in the field of political parties where I have been writing recently, I

discovered what I thought to be a great new thing, namely that political parties really exist because they allow everyone to be concurrently ignorant and intelligent. You can know absolutely nothing about what is going on in politics if you simply say that you are a Democrat or a Republican, and stop there. But this use of the party pervades the legislative halls too, and time after time we discover that a great deal of the voting done in the name of the party is not really party voting because it has nothing to do with issues. People want to justify their actions and so the old cliche of "I'm a Democrat so I voted the Democratic ticket" is used.

The problem of maintaining objectivity in an analysis of function is a difficult one. For example, we could talk about the payoffs of informal communications in much more specific terms. Where do people formally and informally communicate? We discover that the informal is a more pleasant ambience.

On the other side the formal communication is usually prepared under, you might say, *negative* circumstances, with children under foot, grass to mow, in a library stack, etc. Now if you start weighing the respective human values of these two ambiences of functional analysis, then you discover that the time may be approaching when all contributions will be informal, because the surrounding factors are so pleasant in the informal communication.

And this condition will be especially severe when we realize that "nobody reads anybody," that the average number of readers of articles in important psychological journals seem to be about a hundred persons (that's first time readers, perhaps fifty years from now others will read more).

Then we also have a shadow system whereby people buy reprints and foist these upon their friends and hope for some sort of response, thus assuring themselves that there is somebody, somewhere reading.

But that's a very costly system and our authors here are correct to stress the high cost of the informal system. We are paying very heavily for the inadequacies of the formal system.

And we could, as I have pointed out, pay even more highly for the informal system if it spreads more completely in chaotic fashion.

I think we might also have brought out other positive functions of the informal system; perhaps they were implied, I wouldn't say they were not. In some cases there occurs a natural superiority of the informal product. Men say things in their right minds that they wouldn't say when writing for publication. I guess you can put it the other way around, too.

Also, who has the "right mind," the author as he does the first draft? Yes and no. Certainly for heuristic purposes, for teaching others,

there is nothing so useful as a publication that has all the weaknesses of the author in it. By the time you come around to putting out your formal publication, you've seen to it that you are not vulnerable. But also not so bright, perhaps. And the student learns by errors. Nothing is so informative as the errors of a great man.

Of course, there is also the incentive, and you might speak again of the dysfunctions of the informal system, the problem of sloppiness, of grinding out everything that one wishes to communicate.

But you know that the proliferation of the number of magazines in this world is such that it is possible ultimately to publish anything. I could give you a good map of how to publish anything. It could ultimately lead to Pakistan; but it will have the kudos of an editorial board and a linotype machine in back of it.

This mania to publish leads to stern reproofs. For example, Dr. Harold Urey told me in a letter not too long ago that he longed for the old days when a few competent men were in charge of the journals and people really had to go through the hoops in order to have their works published. He said that now every second or third rate government scientist or professor has a mimeograph machine in the back room and turns out anything he pleases.

That is Urey's belief. I emphatically disagree with him.

I wonder, also, whether there will be some kind of accordion-effect developing. Perhaps these gatherings will continue on and on until the world is full of informal communications. But then, if we engage in miracles of retrieval, and push everything else out of the library and just put in retrieval machinery and bibliographies, we'll find that interest in gatherings would stop and informal communications cease.

And will we not also find that this will engender reaction on the part of the elite in the profession. Will they not try to put the damper on informal communication because they discover people will not patronize the shops that the elite have set up in the professional journals and associations. I think we can expect quite a battle here in the form of academic struggles.

As our authors imply, the scientific periodical is theoretically dead. Still it refuses to die. But some people will begin the funeral oration and set off a counter-revolution at some point. At that point we may expect to find sentiments such as those of Dr. Urey, that the professions through their organizations, should control the flow of publications. The rationale will be that the public should not be subjected to the annoyance, the misinformation, and the lack of scientific standards that pervade the hundreds of thousands of informal communications.

We have said nothing about books. Books present a grave problem

of retrieval too. How many titles a year are relevant? Perhaps 20,000 *per annum* at the most are serious books, distributed in prominent languages. Multiply that figure for a generation and you find an astonishing number of titles, at least the equivalent of all the titles that have ever been printed, and these are to be read by people, who if they read like mad for 45 years, will only read a couple of thousand books in their lifetime. Not to mention the articles they must read. So that if we put the articles in with the books, I think we arrive at rather startling statistics on the production of books and articles. The number of books and articles which any generation of scholars can read is small indeed when compared to the mass of reading matter available.

Again we confront this "yin and yan" problem of the elite principle versus the democratic principle. Someone has to pluck up his courage to draw distinctions between material which should be retrieved, material which should be referred to and read, and material which is of little importance and can be ignored.

I am impressed also with the resemblance of this field of research despite its formidable subject-matter, to market research. And we have here very traditional problems in market analysis: to find out what it is that people are consuming, and why they are consuming it, in what forms they would like their materials packaged, where they would like to buy them, and how much you can charge for them.

I've noticed a tendency, carried over from our old puristic days, to forget about these very practical matters and to think that you can somehow study the whole problem of scientific communication as pure theory. But the problems we are talking about are the problems of the gathering, production, dissemination of information, and it is a commodity, or can be construed as such. It may be the most wonderful commodity in the world, and one that we think is much better than toothpaste to concern ourselves with. But we may also find that the many lessons of toothpaste merchandising and marketing are of some use in the fields of scientific communication.

Well, we have had predicted here in the field of scientific communication a crisis within five years. Perhaps that will come true. The first crisis is a conventional crisis, though. If we draw an analogy between the changes in the field of information and the changes which took place in Russia early in this century, we would call this crisis the "Kerensky revolution." Grave inroads will be made in the old system of retrieval; rather simple retrieval systems will be developed; but authors will go on writing as they always have. We shall find better ways of getting a work out quickly and into the right hands.

All of these developments will occur in the "Kerensky phase," and

we may look back with nostalgia at this period of revolution, even though we are Czarists at heart, because the phase after that will be really destructive. That will be the Bolshevik phase in which we can expect a real revolution at the grass roots of communication. There will be changes in the whole manner of writing. Because when you have millions of items to distribute, the problem of redundancy becomes terrible and there must be some steps taken to see that authors do not duplicate each other's work but conduct original inquiries and record their conclusions. The manner of writing will have to be adjusted to the manner of retrieval, thus necessitating adjustments in the design of the computer.

The exigencies of the machine are already affecting scientific vocabularies in the incipient phases of information retrieval and computerized indexing. This in turn will affect the habits of scholars, their manner of writing, and the recognition of scholarship. Ultimately we must cope with the problem of formulating proposals in such a way as to guarantee their retrieval.

There will also occur a final problem: that of the nameless author. Within a generation or so we will be unable to guarantee an author either traditional or conventional identification for his work. The work will either be in a useable form and contribute to its author's anonymity or it will bear his name and make the knowledge of the name an essential factor in retrieval. In the latter case, the work could face little use and in a sense it would achieve its own anonymity.

Undoubtedly we shall survive these successive revolutions in science. They certainly are not as ominous as some of the other transformations which threaten us.