INFLUENCE OF ROLE COMMITMENTS, PERCEIVED-ROLE-CONFLICT, AND GREGARIOUSNESS ON THE PUBLICATION BEHAVIOR OF AGRICULTURAL SCIENTISTS

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ABSTRACT

INFLUENCE OF ROLE COMMITMENTS, PERCEIVED ROLE-CONFLICT, AND GREGARIOUSNESS ON THE PUBLICATION BEHAVIOR OF AGRICULTURAL SCIENTISTS

By H. Stuart Hawkins

The purpose of this study was to investigate the effects of certain social-psychological variables on the lay and professional publication behavior of agricultural scientists. The independent variables were: strength of organizational and professional commitment, strength of perceived role-conflict between these commitments, and the diversity of face-to-face channel usage (i.e., the kinds of different people a scientist talks to about his research).

The dependent variables, lay and professional publication output, and the independent variables, were measured by means of a self-administered mail questionnaire in four land-grant colleges.

A significant positive relationship was found between scientists' commitment to their organization (the university) and their professional discipline. Thus, a scientist who is highly committed to his professional role also tends to be committed to the aims of his employing organization. Strength of professional commitment successfully predicted professional publication output, and strength of organizational commitment predicted lay publication output. However, predicted interactions between organizational and professional commitment to produce higher output of lay or professional publications were not found.

Past research has indicated that a scientist is likely to undergo role-conflict where faced with loyalty to his profession and to his

organization, and where he sees the aims or goals of these mutually incompatible. Although varying degrees of role-conflict were measured, there was no relationship between perceived conflict and publication performance.

Other research has indicated relationships between scientists' performance and their frequency of contact with colleagues from dissimilar backgrounds. In this study it was found that diversity of contact with a number of different kinds of people successfully predicted lay publication performance but not professional publication performance.

Some possible explanations of the results were given, and implications of the findings for research administrators discussed. Recommendations were made with regard to the provision of opportunities for interdisciplinary discussion among research workers.

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By

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CHAPTER I

THE RESEARCH PROBLEM

> "That it shall be the object and duty of said experiment stations to conduct original researches or verify experiments on the physiology of plants and animals; ...and such other researches or experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions and needs of the respective States or Territories."
>
> -- Excerpt from Hatch Act of 1887 establishing Agricultural Experiment Stations.

The provisions of the Morrill Act of 1862 which established the land-grant college institution, and the Hatch Act of 1887 which ensured finances for agricultural experiment stations attached to these colleges ensured a favorable environment to promote agricultural research in the United States. Schools of agriculture in these colleges are charged with the task of adding to the storehouse of knowledge of agriculture and related matters through research, as well as to teaching and extension of agricultural information.

One of the fundamental principles of the land-grant system has been to allow "sympathetic recognition and support of the essentials for research, the type of workers required, and the adjustment of their duties.."[1] Thus, the individual scientist has considerable freedom of

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[1] Recommendations from 39th Meeting of Association of Land-grant Colleges, 1925.

operation within the general structure of the experiment station. However, as these colleges are also charged with the broad duties of solving local agricultural problems and improving standards of rural living, a complementary system of extension services has been developed to disseminate research findings and provide an efficient means of contact between scientists and lay people who make use of these findings. Effective communication between scientists through professional journals, or from scientists to practical users of their findings through extension publications, commercial magazines, etc. is an essential part of the system. Without such organization the dissemination of research findings would be restricted to informal face-to-face channels and thus remain strictly limited.

It is common experience with those who act as intermediate communicators between research workers and lay people that individual researchers vary widely in their productivity of written material. While differences in research content and faculty duties undoubtedly contribute to this situation, it is likely that other underlying social and psychological factors also affect the individual's orientation toward writing. With the proliferation of research findings, the fast expanding technical literature, and the increasing complexity of technical language involved, it is becoming increasingly difficult for either intermediate communicators or lay people to keep up-to-date with research results of potentially practical application. The diffusion of these findings in a readily assimilable form eventually may be facilitated by research workers taking a more active part in communicating direct to prospective users of their or at least in facilitating the task of intermediaries in this direction. The identification of socio-psychological variables associated with

differences in communicative productivity should be of assistance to the administrators charged with the overseeing of research programs, with the dissemination of research results, and perhaps even with the basic education and training of research workers in their undergraduate and graduate years.

The Research Problem

The research worker of an agricultural experiment station at a land-grant college is part of the wider social system but can be seen as operating chiefly within certain subgroups of this system. It is assumed that his behavior within the system will depend in part on his perceptions of the expectations of these subgroups, i.e. their norms and standards of evaluation of him as an incumbent of a position within the system. For the purposes of this study we will consider two of these subgroups: (1) the professional discipline of the individual researcher, and (2) the university of which he is a faculty member. It is appreciated that others might have usefully been included.

While the values and aims of these two groups may not be mutually exclusive and separate, we may consider the individual researcher as an actor in the system who has at least two major roles to play, (i) as a member of his professional discipline, and (ii) as a faculty member of his university. To the extent that he perceives differences in the expectations or requirements of these two roles and that these expectations or requirements appear incompatible, the actor may feel anxiety as to how he might satisfy both. Assuming that his discipline stresses the value of contributing to basic knowledge in the field and of publishing research findings in professional journals, and that in addition, his university emphasizes the value of answering practical problems of rural

areas, the researcher may perceive a degree of conflict in the aims of these two subgroups of which he is a part. Thus, depending on the strength of his commitment to either role, it is suggested that his orientation towards publishing research results for professional colleagues or for direct consumption by lay people will differ. Whereas a low degree of conflict under these circumstances may serve as a positive stimulant to writing activity in either or both areas, it is suggested that a high degree of conflict may have an adverse effect on overall productivity.

The purpose of this study will be to measure the output of professional and lay publications of research workers in schools of agriculture of four land-grant colleges and try to relate variations in productivity to measures of strength of organizational and disciplinary commitment, and degrees of perceived inter-role-conflict, and the diversity of the face-to-face channels of communication used.

Review of Literature

(i) Role and Role-Conflict

The concept of "role," which is central to this study, has received considerable attention in recent years. In a very thorough and searching overview and critique of role theory, Gross, Mason, and McEachern (1958) point out the diversity of meanings held for the concept by such authors as Parsons and Shils, Linton, Newcomb, Sarbin, and others. Despite the plethora of written material, there has been relatively little empirical evidence to allow entirely satisfactory definitions of the concept. Furthermore, what evidence has been produced has at times been contradictory with earlier definitions, e.g., the empirical study of role demands and conflicts among school superintendents by Gross *et al.*

Recent support for some of the ideas advanced by the latter has been given by Levinson (1963) who points out that there are at least three specific senses in which the term "role" has been used, explicitly or implicitly, by various writers:

(a) structurally given demands associated with a given social position (norms, expectations, responsibilities, etc.) In this sense it is a set of pressures that guide, impede, support, or channel an individual's operation in a social system.

(b) a member's orientation or conception of the part he is to play in a system -- his inner definition of what someone in his position is supposed to think and do about it. This viewpoint follows closely the "symbolic interaction" approach of G.H. Mead (1934).

(c) actions of individual members seen in terms of their relevance for the social structure. These are ways in which the members occupying similar positions act in accord or in violation of a given set of norms within the system.

The second of these senses might also be termed personal role-definition. When an individual is confronted with a complex system of requirements, facilities, and conditions of work, he adjusts his mode of behavior to suit conditions as he perceives them. This may involve passive "adjustment," active furthering of role-demands, or attempts to revise his role or the structural context. Thus, personal role-definition may serve to maintain or change the social structure or may involve a high or low degree of self-commitment and personal involvement. Although the individual's conceptions of their role demands in the same position may vary considerably, there must be a degree of consensus about that position within any one organization in order to maintain

structural stability. Whereas this consensus is relatively rigidly adhered to in industrial organizations, it is far more flexible in academic situations with the result that the role-demands of a faculty member may be extremely loosely defined. Similarly, the role-performance of an individual is the resultant of many forces -- the organizational structure and norms, job demands, professional values, personality factors, and so on. In industry, the organizational demands and goals generally are clearly defined -- maintenance of or increase in productivity and maximizing of financial gains. Although some of the same values pertain to a greater or lesser extent in the academic situation, the condition is rather more diffuse. The main difference lies in the greater freedom of the academic to pursue his own course of action.

As has already been pointed out, a person may occupy two or more positions in a social system. For example, research workers perform both as professional members of their discipline and as university faculty members. As Sarbin (1954) points out, "role conflicts occur when a person occupies two or more positions simultaneously and when the role expectations of one are incompatible with the role expectations of the other." On the other hand there can be contradictory expectations held for the incumbent of a single position. Seeman (1953) defines it as "the exposure of the individual in a given position to incompatible expectations perceived by an actor occupying a position with several sets of expectations." Thus, a researcher may view the expectations of his professional group, the university administration, and the eventual users of his findings, as widely divergent or as congruent. Where the expectations are perceived as different but compatible, role congruency exists. However, where the expectations are perceived as both different

and incompatible, perceived role-conflict is likely to be generated. Getzels and Guba (1954) writing on role, role-conflict, and effectiveness, hypothesize a systematic negative relationship between the intensity of an individual's perceived role-conflict and the effectiveness with which he can discharge his role. This adds support to the notion that a researcher who perceives a high degree of incompatibility between his role as a professional researcher and as a member of the experiment station staff may be subject to such a degree of role-conflict that his effective operation is reduced. This may be reflected in a lower quantity of written communications than are produced by colleagues working in a comparable sphere.

(ii) Organization Versus Profession

At this stage it seems fruitful to consider the concepts of "local" and "cosmopolitan" identified by Merton (1957) in his discussion of the patterns of influence in a small Eastern community. The main criterion he uses in distinguishing between these two is in an individual's orientation toward the community. Some of the points he mentions include:

Cosmopolitans: highly selective in their personal relationships, maintaining a limited range of personal contacts largely for the exchange of ideas. Generally active members of voluntary organizations where they can display their knowledge and skills. Recognized in the community for these attributes.

Localites: show marked interest in establishing frequent contact with many people, chiefly for purposes of mutual help. Tend to join voluntary organizations as a means of enlarging a network of contacts. Sought after less for specialized knowledge than

for a sympathetic understanding stemming from close interpersonal relationships.

Gouldner (1957) has extended Merton's concepts to deal more specifically with the social structure of an organization. He suggests that the behaviors expected of, and considered appropriate for, an individual in a particular situation can be termed his "manifest" social role. In any situation, however, the individual is likely to be acting in more than one role, including some that may seem less than appropriate or even irrelevant. Gouldner refers to these as "latent" social roles, i.e., their significance is tied to something not obviously apparent at the time. For example, are the professional group memberships of a researcher usually associated with his manifest role as an experiment station scientist or does he play some latent role in this position as a result of these memberships? Although such roles often appear inappropriate under the circumstances, Gouldner suggests they may affect an individual's behavior more than is apparent on a cursory examination of the situation. He points out that latent roles can be very important in the organization because they may exert pressure on the manifest role systems and can impair the balance of the system. Thus, differences in latent roles may help explain differences in behavior for those performing the same manifest role, e.g., those researchers in the same department of the experiment station engaged in similar work but who perform differently in terms of their communicative productivity to either lay people or fellow professionals. By recognizing the "local" and "cosmopolitan" concepts as latent roles, Gouldner suggests we can examine an individual's performance without focussing solely on his position within the organization or on the stated policies of that organization. He recognizes three major

variables in differentiating between these two concepts:

(i) loyalty to the employing organization;

(ii) commitment to specialized or professional skills;

(iii) reference group orientations, i.e., professional peers within or outside his employing organization.

From these variables he identifies:

A. Cosmopolitans - low on loyalty to the employing organization, high on commitment to specialized role skills, and likely to use an outer reference-group orientation, i.e., look to professional peers outside the employing organization.

B. Locals - high on loyalty to the employing organization, low on commitment to specialized role skills, and likely to use an inner reference group orientation, i.e., look to peers within the employing organization.

In another analysis of the role of local and cosmopolitan scientists in industry, Shepard (1956) points out the problems of conflicting interests between scientists' identification with their professional group and company policies. Whereas the scientist is supposed to be guided by intellectual curiosity and place emphasis on contributing to knowledge, the businessman is guided by the possibility of making profit. Cosmopolitan researchers are oriented towards success as members of their profession and their interest in their employing organization is often limited according to its adequacy as a provider of facilities for the pursuit of professionally rewarding work. Since they are generally productive they may be valuable to the organization, but such value is likely to be almost an accidental by-product of their work. On the other hand, locals are good "company men" who are more concerned with the advancement of the organization than with any specific professional

aspects of their work. In this way they may be of less value to the organization than productive cosmopolitans but will create fewer "human relation" problems.

In a secondary analysis of data collected by Pelz (1956) in a large medical organization, Glaser (1963) reports that "highly motivated" scientists generally were judged better performers than less motivated colleagues. He defines high motivation in terms of those who place high value on their freedom to carry out their own research as well as contributing to basic scientific knowledge -- both of which are characteristics of cosmopolitans. However, apart from being judged as high scientific performers, Glaser found that highly motivated scientists generally put in more time on their own research without sacrifice to other professional activities or organizational commitments. Thus, he considers a high "institutional" motivation (or commitment to one's professional role as a scientist) tends to make scientists both hard working investigators and hard working organizational men. By the criterion that both research and non-research activities are important to them, these highly motivated scientists are <u>both</u> cosmopolitan- and local-oriented. They are oriented towards the institutional goals and rewards of their profession (e.g., recognition by their professional colleagues) and to the responsibilities within their research organization (e.g., applicability of findings, etc., and duties likely to lead to local recognition). It is possible therefore, that as highly motivated scientists are judged better performers than less motivated colleagues, they will also be the most productive writers. One would expect the strength of professional commitment could be related to professional publication output, and strength of organizational commitment to lay publication output,

and that those highly committed to both profession and organization would be the most productive of all.

Kornhauser (1962) points out that there are built-in strains between work establishments and professional institutions with respect to goals and incentives. An industrial concern requires results that develop and improve its products, whereas a professional discipline, while not denying this principle, demands its practitioners maintain standards in the face of contradictory demands of employers. Although there is general consensus among authors on problems of scientists in industry that the goal pressures and opportunities for conflict are considerable, it is probable that they are relatively slight in the academic settings of a university. However, the schools of agriculture of land-grant colleges have service duties of applied research and information diffusion as stated obligations under the Hatch and Morrill Acts. It is conceivable that under these circumstances the expectations of the organization could be perceived by the individual as incompatible with those of his profession. Similarly, although both organization and profession demand loyalty, and reward it with conferred status, it is often possible that the two may clash. For example, a scientist taking on administrative duties to advance his organizational career may curtail his professional activities to such an extent that his professional career is affected.

(iii) Diversity of Contact

Mention has already been made of a study by Pelz of scientific performance of medical researchers. It was found that high performance among scientists, as judged by a panel of colleagues, was significantly

related to a scientific rather than an institutional orientation to their work. In a second series of analyses Pelz discusses the style of communication between professional colleagues as a determinant of performance. He found that high performance was significantly related to scientists having frequent contact with professional colleagues with dissimilar disciplinary interests to their own. He suggests that scientists benefit by frequent opportunities to exchange ideas with people having different values. Whether or not such diversity of contact stimulates researchers to communicate more to lay audiences is not known.

Frequency of contact with local colleagues was found by Menzel and Katz (1955) to be related to the innovativeness of medical practitioners in adopting a new drug. That is, the more frequently a doctor was named by his colleagues as a friend or a discussion partner, the more likely he was to be an innovator with the new drug. They consider that doctors who are well "integrated" into their professional community are more in touch with new ideas and feel more secure in risking innovations. Personal relations, in their opinion, have a strong impact on the making of scientific decisions. In his discussion of the elements of scientific performance, Pelz quotes research by Lieberman and Meltzer in which performance is equated with publication productivity.[1] Assuming that scientific performance and innovativeness are related dimensions, in the light of Menzel and Katz's findings that innovativeness is related to frequency of contact, it seems possible that publication productivity could also be related to frequency of contact.

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[1]Pelz, op. cit. p. 313

(iv) Scientific Performance

In a discussion of scientific productivity, Meltzer (1956) points out that performance can be considered as a complex phenomenon with a number of inter-related components such as creativity, quality, communicability, and quantity of output. It being such a formidable task to combine these into a meaningful measure, Meltzer considers it more fruitful to look at the various factors separately and then to study their interrelationships. In his mail questionnaire study of physiologists he looked at quantity as a factor of performance in much the same way that this study will. He points out that, whereas the criterion of quantity in his study does not have equal units (a book is given the same weight as a paper, and a full authorship the same as a co-authorship), it is assumed that such factors are not of sufficient importance to affect the basic analysis markedly.

Hypotheses for Present Study

This study will focus on two criterion variables, (a) the productivity of experiment station scientists measured in frequency of professional publications, and (b) their productivity measured in frequency of lay publications.

In order to investigate possible predictors of these productivity variables four independent variables will be measured. These are:

(i) the individual scientist's commitment to his professional role as a scientist,

(ii) his commitment to his organizational role as an applied researcher and diffuser of information,

(iii) the degree of conflict he perceives between these two roles, and

(iv) the diversity and frequency of contact with people with whom he discusses his research.

Of the seven hypotheses proposed, the first three are concerned with the degree of commitment to profession or organization, the fourth and fifth with perceived role-conflict, and the last two with diversity and frequency of contact. The hypotheses are as follows:

(1) A person's commitment to his immediate organization is negatively correlated with his commitment to his profession.

(2) The greater a person's commitment to his immediate organization, the greater the number of his lay publications, the difference being accentuated if he is also highly committed to his profession.

(3) The greater a person's commitment to his profession, the greater the number of his professional publications, the difference being accentuated if he is also highly committed to his organization.

(4) The higher a person's perceived role-conflict, the lower his frequency of professional publication.

(5) The higher a person's perceived role-conflict, the lower his frequency of lay publication.

(6) The frequency of a person's lay publications will be positively correlated with his diversity of face-to-face channel usage.

(7) The frequency of a person's professional publications will be positively correlated with his diversity of face-to-face channel usage.

CHAPTER II

RESEARCH DESIGN

Sample Selection and Data Collection

Respondents for the study were drawn from the staffs of the schools of agriculture of the Universities of Connecticut, Massachusetts, Missouri, and Rhode Island. Those included in the sample had bachelors degrees or higher, had the rank of assistant professor or higher, received the whole or part of their salary from the Agricultural Experiment Station of their college, and conducted at least some research. As is typically the case in such institutions where joint appointments are often held, some respondents classified themselves as primarily researchers, and others as part-time research, with additional extension or teaching duties. Department heads and persons employed by the colleges for less than 18 months were excluded from the sample.

A pretest of the questionnaire was conducted in the school of agriculture at one of the New England land-grant colleges during interviews with experiment station scientists. A modified version for self-administration was prepared and forwarded to the remainder of the scientists not interviewed in the first college as well as to the schools of agriculture in three other land-grant institutions.

The self-administered questionnaires were distributed with the assistance of the extension editorial office at each university.

A covering letter was sent with each questionnaire explaining in broad terms the purpose of the study and requesting the cooperation of the respondent. A stamped, addressed envelope was included to facilitate direct return and to ensure the confidential nature of replies. No attempt was made to follow up respondents.

Operationalization of Variables

(i) Criterion Variables

The dependent variable in this study is publication productivity of individual experiment station scientists during the three years prior to answering the questionnaire. This is divided into publications written primarily for a professional audience and those written for a nonprofessional or lay audience.

A. Professional Publications

These are articles or papers written for a professional audience, i.e., fellow agricultural scientists or members of a particular discipline. Each separate article, etc. is given the same weight of one unit irrespective of length, quality, readability, etc. While it is appreciated that this is a poor index in many ways, it is felt that a more complex approach would be unwarranted at this stage. Furthermore, the work of Meltzer quoted above suggests that any errors introduced in this method of analysis should not markedly affect overall results.

To provide a score for "professional publications," respondents were asked to inventory their publications in the areas of journals or papers, experiment station bulletins, or books, directed at a professional audience.[1]

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[1]For details of the questions see Appendix A, questions 27-28, 29-30, and 35.

Although it is assumed that all articles named as being written for professional journals can be included in this category, respondents were asked to name the journals so that a validity check of the professional nature of their writings could be made if necessary. The question used was:

> 27-28 Have you published, or had accepted for publication, any articles or papers in scientific journals or publications in the last three years?
>
> Yes:___ No:___ If yes, could you please list the names of the journals and how many articles in each?

In the case of experiment station publications (as distinct from extension publications) and books, respondents were asked whether their audience was primarily professional or lay.

B. Lay Publications

Lay publications are defined as articles, papers, extension publications, or books, written primarily for nonprofessional audiences, e.g., farmers or other practical users of research findings. They are measured in the same way as professional publications, i.e., each separate article is given a weight of one unit.

To provide a score for "lay publications," respondents were asked to inventory their publications in the areas of experiment station bulletins, extension-service publications, commercial magazines or newspapers, and books, directed at a nonprofessional audience.[1]

As there is greater variability in the type of publication for which lay articles are written, questions were worded to allow more detailed specification of the scientist's communication behavior. For

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[1]For details of the questions see Appendix A, questions 29-30, 31-32, 33-34, and 35.

example, in questions 29-30 for experiment station articles, and question 35 for books, respondents were asked to indicate whether they were written primarily for a lay or professional audience.

29-30 Have you published, or had accepted for publication, any experiment station bulletins in the last three years?

Yes:___ No:___ If yes, how many? _____

How many of these were directed at:
_____ a professional audience
_____ a nonprofessional audience.

(ii) Independent Variables

A. Commitment to Organization

In the review of the literature the concepts of "localite" and "cosmopolite" were discussed at length. It was pointed out that Gouldner and Glaser have modified Merton's use of the terms to include members of industrial and research organizations. They were able to typify people according to such criteria as loyalty to their organization or to their discipline.

In this study it is intended to classify scientists according to their expressed commitment to their profession or to their university (organization). In a series of questions (38, 40, 42 & 44) the strengths of their values for being known as a faculty member, as being active in university affairs, as a source of advice for extension workers, and as a source of practical ideas for farmers, are tapped to indicate the strength of their organizational orientation. A person with a high score on the four questions will be considered as being highly committed to his organization. For example, Question 38 was:

How important is it to you to be known as a member of the University faculty?

4___extremely important
3___very important
2___fairly important
1___not very important
0___not at all important

In framing these questions it has been assumed that scientists recognize the original, practical research aims expressed in the Hatch Act as part of their current organizational obligations. A score range from 0 - 16 was possible.

B. Commitment to Profession

In a similar manner to organizational commitment, professional commitment has been tapped by a series of four questions (37, 39, 41, & 43). These aim to measure the strength of their values for disciplinary expertness, for contributions to basic scientific knowledge, for membership in their scientific organizations, and for being known as good researchers. For example, Question 37:

> How important is it to you to be known as an <u>expert</u> in your discipline?
>
> 4___extremely important
> 3___very important
> 2___fairly important
> 1___not very important
> 0___not at all important
>
> A score range of 0 - 16 was possible.

C. Role-Conflict

The lack of consensus regarding the meanings of the concept "role" has been made clear earlier. It is intended here to use the meaning outlined by Levinson as a working definition.[1] A role is seen as a

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[1]Levinson, <u>op. cit.</u>

member's orientation or conception of the part he is to play within a system. Thus, role-conflict occurs when he occupies simultaneously two or more positions and perceives incompatibilities in the expectations of these.

In this study the two roles concerned are those:

(a) of the individual as a professional, a member of his scientific discipline, and a researcher, and

(b) the individual as a member of the College of Agriculture, of the faculty of his university and employing organization.

As the service functions associated with schools of agriculture in land-grant colleges are rather unusual organizational goals for the university as a whole, it seems likely that conflict could be perceived between an experiment station scientist's role prescription as a professional and as a member of the organization. His professional commitments might lead him to perceive his goals as the contribution to scientific knowledge through fundamental research, whereas the organizational goals may lay stress on the need for practical solutions to local problems and the dissemination of information to farmers.

Seven questions (45-51) aim to measure the extent to which an individual perceives the goals of his profession and organization in conflict. Thus, a person classified as high in role-conflict in this study is one who perceives incompatible differences between the expectations of fellow professionals and the College of Agriculture of his university, and hence scores highly on these questions. For example, Question 45:

> Now... As a member of the Experiment Station staff you perform duties as a <u>scientist</u>, following the principles of your discipline. You also perform duties as a member of the College of Agriculture of your university, trying to serve <u>their</u> goals.

In performing your job as a scientist and as a member of the College of Agriculture, how often do you find the goals of these two groups in conflict. Would it be...

4___very often
3___fairly often
2___now and then
1___seldom
0___never

A total score range of 0 - 24 was possible on these seven questions.

D. Diversity of Face-to-Face Channel Usage

Pelz' findings discussed earlier indicate that scientists generally perform better when they have regular contact with a variety of colleagues in different disciplines than when they do not. While it is somewhat difficult to probe the diversity of contacts of an agricultural scientist by means of a self-administered questionnaire, an attempt has been made to do so with questions about the frequency of contact with different categories of people he talks to about his research, e.g., fellow researchers on- and off-campus, administrators, extension men, etc.[1] For example,

How often do you talk to the following kinds of people about your research?

Commercial Researchers ___several times a week
___about once a week
___once or twice a month
___less than once a month.

Nine categories of such people were listed and the total frequency of contact was determined for each category. On the basis of the frequency distributions for each item, people were classified as being above average (scoring 1) or below average (scoring 0) in contact for

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[1]See Question 52 in the Appendix

each category. The medians of the frequency distributions were at the "about once a week" level for Department Head and Fellow Researchers On-Campus, and at the "once or twice a month" level for the remainder. An index of diversity of contact was then established for each person on the basis of the sum of his scores for the nine categories.

Data Analysis

Five hypotheses were tested with product-moment correlations. In order to investigate variations in productivity of lay and professional publications with concomitant variations in the level of professional and organizational commitment, two hypotheses (H2 and H3) were tested with a two-way analysis of variance. As the ratios of cell-N's in columns were not proportional, an approximation procedure involving a treatments-by-levels type of analysis was conducted on the matrix of cell means.[1]

[1]For details of the procedure see Walker and Lev, pp. 381-382.

CHAPTER III

FINDINGS

Description of the Sample

Response to the Questionnaire

In this study it was sought to question all full-time and part-time research, research-extension, or research-teaching staff of the agricultural experiment stations of four land-grant colleges by means of a self-administered mail questionnaire.

Of the 250 questionnaires distributed, 150 (60%) were returned. After removing ineligible respondents a final sample size of 121 (48%) was attained. Returns from the four colleges were much the same. For a tabulation of responses by colleges see Table 1.

Age, Rank, and Academic Degree

The comparability of the four colleges in terms of respondents' age, academic status, and highest degree is shown in Table 2. Respondents from the different colleges did not differ significantly on these attributes.[1]

Nearly three-quarters of the respondents were under 50 years of age, and the largest percentage of these were in their forties. More

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[1]Age: Chi square = 13.03, d.f. = 9; Academic Rank: Chi square = 12.53, d.f. = 6; Highest degree; Chi square = 4.16, d.f. = 6.

than three-quarters had academic status higher than that of assistant professorship, the numbers being fairly evenly divided between those with associate and full professorships. The doctoral degree was by far the most common in all colleges, with four out of every five respondents having achieved this level. Of the remainder, the majority held master's degrees.

Table 1. Response to questionnaire

Completed Questionnaire (usable)	56%	48%	44%	50%
Ineligible	4	11	12	10
Non-Response	40	41	44	40
	100%	100%	100%	100%
Questionnaires Distributed (N =)	25	85	45	100

Table 2. Description of sample on personal attributes, by college

	Colleges				
Personal Characteristics	A	B	C	D	Total Sample
Age:					
Under 40	43%	24%	62%	24%	31%
40-49 years	43	49	19	44	42
50-59 years	14	22	19	22	21
60 years and older	0	5	0	10	6
	100%	100%	100%	100%	100%
Academic Status:					
Assistant Professor	22%	22%	31%	20%	22%
Associate Professor	64	27	56	38	40
Professor	14	51	13	40	37
Emeritus Professor	0	0	0	2	1
	100%	100%	100%	100%	100%
Highest Degree:					
Bachelors	0%	5%	6%	4%	4%
Masters	14	15	25	8	13
Doctoral	86	80	69	88	83
	100%	100%	100%	100%	100%
N =	12	41	16	50	121

Publication Output

The principal variables of interest in this study are the numbers of lay and professional publications produced by experiment station scientists in the three years prior to answering the questionnaire. They were questioned about the number of papers, bulletins, articles, books, etc. they had written for either professional or lay audiences. The distribution of their replies is shown in Table 3.

Although experiment station scientists tend to produce slightly more professional than lay publications, there is considerable variability among staff members in their levels of productivity of either type. An almost even number of scientists were the most prolific writers of both professional and lay publications over a three year period. (19% for professional and 21% for lay). However, there is an uneven distribution of those who produce the least number of publications of either type; 45% of the respondents produced one or no lay publications during the sample period, while only 24% produced as few professional publications.

Thus it seems that, although the production of professional publications is fairly evenly distributed among staff members, the bulk of writing for nonprofessional audiences is done by a productive few; whereas 53% of the scientists produce three-quarters of the professional publications, only 36% produce three-quarters of the lay publications.

Table 3. Production of professional and lay publications

No. of Publications:	Professional	Lay
0 - 1	24%	45%
2 - 3	23	14
4 - 5	24	12
6 - 7	10	8
8 or more	19	21
	100%	100%
N =	121	121
Mean Number of Publications per Person	4.1	3.4
Standard Deviation	2.9	3.3

Table 4. Mean professional commitment at different levels of organizational commitment

	Organizational Commitment			
	Low	Med.-Low	Med.-High	High
Mean Professional Commitment	9.9	11.9	12.6	13.1
Sample Size (N =)	23	33	32	33

Tests of Hypotheses

For five hypotheses proposed, two significant positive and three significant negative correlations were predicted. In addition, by breaking the variables "professional" and "organizational" commitment into two levels, High and Low, an interaction effect was predicted for two hypotheses.

H1: A person's commitment to his immediate organization is negatively correlated with his commitment to his profession.

As described previously, separate indices for respondents' commitment to their immediate organization (the university) and to their professional discipline were compiled. On the basis of previous research,

particularly that of Kornhauser, a significant negative relationship was predicted between an individual's commitment to his organization and to his profession. However, the product-moment correlation between these two variables was .44, a significant relationship in the opposite direction to that predicted.[1] Therefore, H1 was not confirmed.

By dividing organizational commitment scores into four levels the mean professional commitment scores for each level show a corresponding increase with increasing organizational commitment. (see Table 4). This indicates that if a person is highly committed to his organization, he also tends to be highly committed to his profession.

> H2: The greater a person's commitment to his immediate organization, the greater the number of his lay publications, the difference being accentuated if he is also highly committed to his profession.

The product-moment correlation of .44 between organizational commitment and number of lay publications indicates a significant relationship in the direction predicted by H2. The accentuated difference hypothesized when individuals are highly committed to both their profession and their organization did not prove significant. To test the hypothesis, organizational and professional commitment scores were split at the median into high and low levels and a two-way analysis of variance was carried out, using the approximation procedure cited earlier.

Table 5 presents the mean number of lay publications for each level of organizational and professional commitment. From these results it is concluded that, irrespective of the level of professional commitment, at high levels of organizational commitment, scientists produced

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[1] A product-moment correlation of .18 was needed to be significant at the .05 level, two-tailed test.

about twice as many publications as at low levels of commitment. In its present form then, H2 is therefore not supported. It is accurate, however, if the qualifying clause "...the difference being accentuated if he is also highly committed to his profession" -- is dropped.

Table 5. Mean number of lay publications produced at different levels of organizational and professional commitment

		Organizational Commitment	
		Low	High
Professional Commitment	High :	2.2	4.5
	Low :	2.0	4.6
Sample Size	Hi Prof. Comm. :	17	39
	Lo Prof. Comm. :	39	26

Analysis of Variance - Summary

Source of Variation	S.S.	d.f.	M.S.	F	$F_{.95}$
Between Levels Org. Comm.	5.89	1	5.89	15.91	3.93
Between Levels Prof. Comm.	0.01	1	0.01	0.03	3.93
Interaction	0.02	1	0.02	0.05	3.93
Error		117	0.37		

H3: The greater a person's commitment to his profession, the greater the number of his professional publications, the difference being accentuated if he is also highly committed to his organization.

The product-moment correlation between professional commitment and number of professional publications of .37 indicates a significant positive relationship. In a similar manner to the previous hypothesis, a two-way analysis of variance confirmed the relationship but failed to confirm the accentuated difference hypothesized for individuals committed highly to both their organization and their profession. In its

present form, then, H3 was also not supported but is accurate by dropping the qualifying clause: "...the difference being accentuated if he is also highly committed to his organization."

Table 6 presents the mean number of professional publications for each level of organizational and professional commitment. The findings indicate that, at high levels of professional commitment, scientists produce about twice as many publications as at low levels of commitment, irrespective of their level of organizational commitment.

Table 6. Mean number of professional publications produced at different levels of organizational and professional commitment

		Professional Commitment	
		Low	High
Organizational Commitment	High :	2.3	5.1
	Low :	3.5	5.8
Sample Size	Hi Org. Comm. :	26	39
	Lo Org. Comm. :	39	17

Analysis of Variance - Summary

Source of Variation	S.S.	d.f.	M.S.	F	$F_{.95}$
Between Levels Prof. Comm.	6.40	1	6.40	23.70	3.93
Between Levels Org. Comm.	0.99	1	0.99	3.67	3.93
Interaction	0.03	1	0.03	0.11	3.93
Error		117	0.27		

H4: The higher a person's perceived role-conflict, the lower his frequency of professional publication.

Although there was a negative relationship between perceived role-conflict and frequency of professional publication, as predicted, the product-moment correlation of -.12 was not significant. H4 was therefore

not confirmed. In Table 7 the mean number of professional publications for different amounts of perceived role-conflict are given. It is concluded that, at different levels of perceived role-conflict, scientists do not differ significantly in the number of professional publications produced.

H5: The higher a person's perceived role-conflict, the lower his frequency of lay publication.

The predicted relationship between perceived role-conflict and frequency of lay publications was not significant, the product-moment correlation being .09. Further checking indicated that the low correlation was not due to lack of linearity. The eta for the relationship was .19, but was not statistically significant.[1] H5 was therefore not confirmed. The mean numbers of lay publications for different levels of perceived role-conflict are given in Table 7. These results indicate that scientists do not differ significantly in their frequency of lay publication at different levels of perceived role-conflict.

Table 7. Mean number of professional and lay publications produced at different levels of perceived role-conflict

	Perceived Role-Conflict			
	Low	Med.-Low	Med.-High	High
Mean Number of Professional Publications	4.6	4.5	3.6	3.9
Mean Number of Lay Publications	2.5	3.4	4.4	3.4
Sample Size (N =)	27	27	27	40

[1] F statistic = 1.53; d.f. = 3 & 118, n.s.

H6: The frequency of a person's lay publications will be positively correlated with his diversity of face-to-face channel usage.

The predicted relationship between the diversity of face-to-face channel usage and the output of lay publications was found to be significant. The product-moment correlation was .32. H6 was therefore supported. The mean numbers of lay publications produced for four levels of channel diversity are shown in Table 8.

These results indicate that the greater the number of a diverse range of people a scientist talks to about his research, the more lay publications he will produce. Thus, a person who was rated as highly diverse in his face-to-face channel usage produced three times as many lay publications as a person rated low in diversity.

H7: The frequency of a person's professional publication will be positively correlated with his diversity of face-to-face channel usage.

With a product-moment correlation of .07 between the diversity of channels of face-to-face communication usage and output of professional publications there appeared to be no significant relationship. Therefore, H7 was not confirmed. The mean number of professional publications produced at four levels of channel diversity are shown in Table 8. It is concluded that diversity of channel usage has no significant effect on the productivity of professional publications.

Table 8. Mean numbers of lay and professional publications produced at different levels of diversity of face-to-face channel usage

	Diversity of Channel Usage			
	Low	Med.-Low	Med.-High	High
Mean Number of Lay Publications	1.5	3.5	3.5	4.6
Mean Number of Professional Publications	4.0	4.6	3.7	4.4
Sample Size (N =)	23	24	41	33

Other General Findings

Although no specific relationships were hypothesized between the variables already discussed and academic rank, highest degree, or year of appointment, data on the latter three were collected for descriptive purposes.

A significant correlation existed between academic rank and output of professional publications ($r = .23$) but the relationship between rank and output of lay publications ($r = .12$) was non-significant. As might be expected, a significant relationship was found between "highest academic degree attained" and output of professional publications ($r = .23$), but no relationship was demonstrated between highest degree and output of lay publications ($r = .06$). It seems then, that academic degree and rank will affect the output of professional publications but have no influence on the productivity of lay publications.

Professional commitment and highest academic degree were significantly related ($r = .29$) but no relationship was found between organizational commitment and degree ($r = .03$). Although not strong, ($r = .18$), a significant positive relationship existed between perceived role-conflict and year of appointment. This suggests that scientists perceive more confliction between the goals of their organization and those of their discipline the longer they remain in the organization.

CHAPTER IV

DISCUSSION

Summary

The present study was designed to evaluate the relationships between the professional and lay publication productivity of agricultural experiment station scientists and certain social-psychological variables. Seven hypotheses were derived from existing research findings and tested by means of a self-administered questionnaire at four land-grant colleges.

On the basis of research findings in industry a significant negative correlation was predicted between a scientist's commitment to his immediate organization -- the university -- and to his professional discipline. The reverse was found to be the case. A scientist who is highly committed to his professional role also tends to be highly committed to the aims of his more immediate employing organization.

Although there is no past research to directly suggest a relationship between professional commitment and professional publication productivity, on common sense grounds it seemed they should be related. Similarly, it seemed reasonable that, if the communication of agricultural information was one of the stated aims of the land-grant college, lay publication output should be related to organizational commitment. Both relationships were significant as predicted. However, on the basis of Glaser's notion of the dual, cosmopolitan-local orientation of highly

motivated scientists, it was also predicted that a person's high organizational commitment and high professional commitment, when found, would interact to produce even higher professional publication output. Similarly, it was predicted that a person's high professional commitment and high organizational commitment when found, would interact to produce a higher output of lay publications. As neither of these predictions were supported, it appears that professional and lay publication behavior are independent dimensions with no interaction effect between professional and organizational commitment on publication output.

Past research, including that in the industrial field, has indicated that a scientist is likely to undergo role-conflict where he is faced with two loyalties, to his profession and to his organization, and where he sees the aims or goals of these as mutually incompatible. Such role-conflict may result in decreased working efficiency. The present study, although indicating that varying degrees of conflict were perceived, gave no indication of a significant relationship between perceived conflict and publication performance.

Another earlier research finding indicated that scientists' performances, as judged by a panel of fellow scientists, were significantly related to frequent contact with colleagues dissimilar to themselves in professional backgrounds and interests. Although the specific issues on which judgment was made were not specified, it is likely that publication productivity was an important factor on which performance was assessed. In this study it was hypothesized that diversity of face-to-face channel usage would be related to publication productivity. Results were significant only for lay publications, suggesting that a diverse range of contacts stimulates experiment station scientists to

write for lay audiences but does not affect their publication output for professional audiences.

Organizational and Professional Commitment

In the earlier discussion of Kornhauser's research on scientists in industry, it was pointed out that professional and organizational goals were frequently in opposition. Whereas industrial organizations seeks to channel the efforts of their employees along their own lines to serve their own ends; "The various actions of the scientist, qua scientist, are undertaken because they add to knowledge, not because of any immediate benefit to any individual or group..."[1] Hence, the scientist deeply committed to his profession may find it difficult to adhere to organizational requirements for research oriented largely towards the application of knowledge for profit maximization. At the same time, the organizationally-oriented scientist, in doing his best to meet requirements, is usually less interested in his research than he is in the advancement of the organization, thus being less likely to produce many results of value to the organization according to Kornhauser. It was largely on the basis of these considerations that a negative relationship was hypothesized between organizational and professional commitment among agricultural experiment station scientists.

The findings that these commitments are significantly positively related suggests that such role-conflict does not exist in the more academic setting of the land-grant college. However, respondents did indicate varying degrees of role-conflict. It is possible that this effect was due to the design of the questionnaire. By placing the

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[1]E.C. Hughes, Men and Their Work, F.P. of Glencoe, Ill., 1958, p. 139.

questions tapping commitment before those measuring conflict, it is conceivable that respondents were predisposed to indicate role-conflict, having had their attention drawn to the possibility of its presence.

Although the possibility of a positive relationship between professional and organizational commitment was considered in formulating the hypothesis originally, it was felt that the service functions of the land-grant college might be perceived as incompatible with professional aims. However, subsequent evidence has indicated that the aims and goals of these organizations may not be well understood by their members.[1] In this situation, presumably the role prescriptions for research positions within the organization would be rather vague and the possibility of perceived incompatibilities between professional and organizational goals would be diminished. Also, as research administrators in land-grant colleges are generally active research or ex-research workers themselves, they are likely to be more sympathetic toward the professional orientation of their charges than are their industrial counterparts. They are more likely to try to steer a course between a heavy stress on the utility of findings and full "academic freedom" in research, i.e., the ability to research problems of their own choosing without organizational constraint. The findings tend to support Glaser's contention that some highly committed professional men may also be highly committed to their organization. They have what he calls a "local-cosmopolitan" orientation.

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[1]Couch, Miller, and Murray point out that, in one of the colleges, half of the scientists interviewed in their sample did not know the aims and objectives of their organization while the remainder could make only a very general statement inferring that their research efforts were "for the betterment of the lot of men."

Additional evidence for this viewpoint is also suggested from the results of personal interviews with experiment station scientists at one of the four colleges (Couch, Miller, and Murray, 1964). Most of them considered that they were in their "ideal" job. The college was a desirable environment to work in, and as research was their chosen career into which much effort had gone, it would take a lot to move them from this to another job or organization. Nevertheless, there were still small things they would like to see improved or changed.

Since the two types of commitment were fairly highly correlated with each other, one might ask whether it is useful to distinguish between the two types. It might be just as meaningful to combine them into a single commitment score. To check this, the correlations between all of the eight individual items comprising the two indices were studied. When the four "professional commitment" items were intercorrelated, their average (mean) inter-item correlation was .41. This indicates how much the four items have in common. When the four "organizational commitment" items were intercorrelated, their average (mean) inter-item correlation was .38. However, when each of the four "professional commitment" items were intercorrelated with each of the four "organizational commitment" items, the mean of the 16 correlation coefficients was .24. This latter correlation coefficient suggests some commonnesses in the two types of commitment, as did the correlation of .44 between the total scores for the two indices. However, there is considerably more homogeneity <u>within</u> each of the two sets of items than there is when the two sets are combined. Therefore, it seems meaningful to maintain the distinction between the two types of commitment.

Strength of Commitment and Publication Output

It is generally conceded in the literature that publication output is the most common base for assessing scientific performance, at least in universities. As Caplow and McGee (1958) state: "It is neither an overgeneralization nor an oversimplification to state that in the faculties of major universities in the United States today, the evaluation of performance is based almost exclusively on publication of scholarly books or articles in professional journals as evidence of research activity."[1] It would seem a logical corollary then, that the output of professional publications should be positively related to the strength of an individual's commitment to his profession, as indeed it was in this study.

However, there is no prior evidence to the author's knowledge, to lead so clearly to the hypothesis concerning organizational commitment and output of lay publications. The significant relationship found between these variables suggests that experiment station scientists who are conscious of their obligations and commitments to an academic organization with a stated duty to transmit practical information, will be motivated to write more for such nonprofessional audiences. In this situation their rewards may lie either in the knowledge that they are communicating useful information, or that they are helping fulfill one of the purposes of their organization and hence presumably gaining in prestige within the organization.

The findings from testing the first hypothesis support Glaser's notion that professional and organizational commitment can be positively related dimensions of orientation of the same scientist. However,

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[1]Caplow and McGee, 1958, p. 83.

further testing revealed a lack of interaction between professional commitment and lay publications at increasing levels of organizational commitment, and a similar lack of interaction between organizational commitment and professional publications at increasing levels of professional commitment. These findings suggest that the two classes of publications are separate dimensions, and the productivity of each may be "activated at the appropriate time and place as determined by the organizational structure within which he works."[1]

Perceived Role-Conflict and Publication Output

Role-conflict is likely to occur whenever a person is called upon to fill two or more roles whose expectations appear incompatible. To reduce or remove such conflict there are several courses he may follow. He may either abandon one role and concentrate on the others, he may attempt a compromise, or he may withdraw either physically or psychologically. In all instances, if his actions affect some aspect of his work, it is conceivable that his working efficiency could be affected, probably adversely where withdrawal or compromise takes place.

In a superficial comparison of the academic environment of a land-grant college and an industrial situation there may appear to be much less opportunity for role-conflict to arise in the former. As Caplow and McGee point out: "Above all, the university is remarkable for pursuing an intricate program with little agreement about fundamental purposes. It is easy for people to agree that the purpose of a factory is production, even if they disagree violently about methods or the distribution of earnings. It is not at all easy ...to determine the fundamental purposes of a university or the relative importance of different activities

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[1]Glaser, 1963, p. 257.

in contributing to those purposes."[1]

In this situation one might expect a faculty member to be able to follow his chosen course without much actual or perceived interference from the administration. However, the experiment station scientist is employed by that part of the university charged with specific service functions of seeking answers to applied problems and diffusing information, as well as with the more diffuse aims of contributing to the storehouse of scientific knowledge. It is therefore conceivable that he may perceive some conflict between his professional role as a scientist, where the stress is on contributing to knowledge, and his organizational role as a faculty member, applied researcher, and information diffuser. Although respondents' scores on questions designed to tap the presence of such perceived role-conflict apparently did indicate the presence of varying degrees of conflict, there was no significant relationship between these scores and the output of either professional or lay publications.

It is conceivable that the highly motivated scientist will always perceive a degree of role-conflict between his teaching and other faculty duties and his professional research career especially if, as pointed out earlier, he is alerted to the possibility that it may exist. However, it appears that this conflict will not divert him from his professional commitment of contributing to scientific knowledge via professional publications, or to his organizational responsibilities of diffusing information in lay publications.

Channel Diversity and Publication Output

Assuming that high publication output is a desirable facet of scientific performance, what are some social factors that appear to influence such performance? Should a scientist be encouraged to develop a broad

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[1]Caplow and McGee, op. cit., p. 4.

range of contacts or should he be placed in a situation with minimum distractions from all but his immediate colleagues? These are questions that may concern a research administrator who wishes to develop a working environment conducive to maximum performance.

It was pointed out in earlier discussion that the work of Pelz and others at the Institute for Social Research at Ann Arbor has shown that high performance among scientists, as judged by their fellows, was related to their having frequent contact with professional colleagues from backgrounds dissimilar to their own. However, no indication is given how a diverse range of face-to-face contacts might affect the publication performance of scientists. In the present study an index of diversity of face-to-face contact was established and found to be significantly related to output of lay but not professional publications. This suggests that the more gregarious he is in his habits, or the wider his range of personal distinct from impersonal contacts, the more an experiment station scientist is motivated to write for a lay audience. Although perhaps not quite parallel, Merton's contention that "localites" seek to establish frequent contact with many people, chiefly for the purpose of mutual help, would seem to be in line with these findings. The diversity of his contacts may make him more aware of problems for which he has practical solutions, especially in the experiment station environment where he can mix with extension workers who are closely in touch with field problems. As a highly committed organization man, he may then be motivated to assist farmers by writing articles with a practical orientation.

These relationships might not hold so well in other situations where there is less contact with practical problems and where discussions

with research colleagues may be confined more to research, qua research, problems.

Implications

By understanding more about the social and psychological bases of scientists' behavior, research administrators should be in a better position to evaluate individual performance and to organize an optimal environment for research activity. From this study emerges the picture of the experiment station scientist in a land-grant college as a person who, if strongly committed to his profession, will also be committed to the goals of his employing organization. This implies that any conflict he perceives between the two is insufficient to impair his performance as a fundamental researcher when fulfilling his duties as a member of his organization, or vice-versa.

Although publication is only one facet of his work productivity, it is an important and tangible measure of his performance. For better or for worse, it is often the index upon which research administrators evaluate the individual. Hence, any information concerning relationships between scientists' publication behavior and underlying social-psychological or environmental factors, should be of positive value to administrators seeking to improve channels of communication between laboratory and field practice. Such information is provided by the finding that a diverse range of face-to-face contacts is positively related to lay publication productivity.. This suggests that administrators seeking to maintain a strong flow of applied research results from experiment stations to farmers should encourage opportunities for researchers to mix with a wider range of contacts in discussing their research.

In research organizations where no emphasis is placed on the

application of research findings for profit making, there is a purposive effort by the administration to interfere with scientists as little as possible and to allow them to pursue their chosen course with a minimum of non-research involvement.[1] Despite the service responsibilities of land-grant institutions, the findings of this study with respect to the professional orientation of their scientists' and their publication behavior, give no reason to suggest otherwise. Thus, the highly committed professional will continue to write for his professional audience despite an equally high commitment to his organization. Similarly, the productive communicator of nonprofessional information, in helping fulfill a stated task of his organization, does not necessarily neglect his professional commitments. Apparently, any conflict they perceive between the goals of profession and organization is not reflected by lower publication output for either category.

As land-grant colleges are organizations with specific aims,[2] often not well understood by the majority of their members,[3] administrators may want their charges to be more aware of, and to identify themselves more closely with, the organizational aims. The "organizational" aim of land-grant colleges relevant to this study has been the dissemination of research findings to farmers and other practical users of such information. However, in clarifying the aims of their organization, administrators perhaps should stress the congruency between these aims and those of the professional disciplines represented by faculty members.

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[1]Gillespie, pp. 22-23.

[2]See references to the Hatch and Morrill Acts, p. 1, above.

[3]Couch, Miller, and Murray, op. cit.

According to Glaser,[1] if the organizational goal of applied research is heavily emphasized, those deeply committed toward fundamental research may perceive increasing conflict, reduce the strength of their organizational commitment, and become isolated "cosmopolitans" oriented solely toward their profession. Similarly, those already oriented toward applied research may neglect their professional obligations.

The findings concerning channel diversity of face-to-face contact suggest more positively a fruitful direction for administrators. By encouraging interdisciplinary discussions and the free interchange of ideas at all levels, it seems likely that the desired objective of more effective communication with lay audiences will be achieved, at least to the extent that researchers will tend to write more for those audiences.

It is appreciated that certain environmental factors peculiar to the land-grant college system reduce the generalizability of these findings. Many research organizations do not have teaching responsibilities combined with the regular functions of their research groups, and may not have well developed extension services to disseminate information to and provide feedback from the users of their findings. To extend the applicability of the present research it would be fruitful to test the hypotheses concerning relationships between diversity of face-to-face contact and publication behavior in other organizations where these extension and teaching facilities do not exist.

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[1] Glaser, p. 259.

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Appendix A

Questionnaire for Agricultural Scientists

APPENDIX A

QUESTIONNAIRE FOR AGRICULTURAL SCIENTISTS

Project Number 160
Phase Number 01
Respondent Number

Name : _____

Age : _____ Sex : ____

Department : _____

Specialty : _____

Year of Accepting Present Position : _____

Bachelors Degree : Yes: ____ No: _____

Masters Degree : Yes: ____ No: _____

Doctoral Degree : Yes: ____ No: _____

Honorary or Other Degrees : _____

Do you classify yourself as: _____ Primarily a researcher
_____ Primarily an extension specialist
_____ About half of each

Now, could I have some details on HOW you report your research findings?

27-28 Have you published or had accepted for publication any articles or papers in scientific journals or publications in the last three years?

Yes: ___ No: ___ If yes, could you please list the names of the journals and how many articles in each.

Journal	Number

29-30 Have you published, or had accepted for publication, any experiment station bulletins in the last three years?

Yes: ___ No: ___ If yes, how many? : _____

How many of these were directed at: __ a professional audience
__ a nonprofessional audience

31-32 Have you published, or had accepted for publication, any articles, bulletins, circulars, leaflets, etc. for state or federal extension service publications in the last three years?

Yes: ___ No: ___ If yes, how many? ___ (n.b. please give one number for all types)

33-34 Have you written any articles for commercial or popular magazines or newspapers in the last three years?

Yes: ___ No: ___ If yes, how many? : _____

35 Have you written any books in the last three years?

Yes: ___ No: ___ If yes, what was it called? : _____

Did you write it primarily for: ___a professional audience
___a nonprofessional audience
___both

Now something a little different... If one of your colleagues was asked to characterize you as a person, he might do it in a number of ways. Here are some phrases he might use. After reading each phrase, please mark the statement which best indicates how important it is for you to be known this way. Here is the first phrase....

36 How important is it to you to be known as a good teacher?

4___extremely important
3___very important
2___fairly important
1___not very important
0___not at all important

37 How important is it to you to be known as an expert in your discipline?

4___extremely important
3___very important
2___fairly important
1___not very important
0___not at all important

38 How important is it to you to be known as a member of the University faculty?

4___Extremely important
3___very important
2___fairly important
1___not very important
0___not at all important

39 ...as a contributor to basic scientific knowledge?

4___extremely important
3___very important
2___fairly important
1___not very important
0___not at all important

40 ...as an active participant in university affairs?

4___extremely important
3___very important
2___fairly important
1___not very important
0___not at all important

41 ...as a member of your scientific organization?

4___extremely important
3___very important
2___fairly important
1___not very important
0___not at all important

42 ...as a source of advice for extension workers?

4___extremely important
3___very important
2___fairly important
1___not very important
0___not at all important

43 ...as a good researcher?

4___extremely important
3___very important
2___fairly important
1___not very important
0___not at all important

44 ...as a source of practical ideas for farmers or other users of your findings?

4___extremely important
3___very important
2___fairly important
1___not very important
0___not at all important

Now... As a member of the Experiment Station staff you perform duties as a scientist, following the principles of your discipline. You also perform duties as a member of the College of Agriculture of your university, trying to serve their goals.

45 In performing your job as a scientist and as a member of the College of Agriculture, how often do you find the goals of these two groups in conflict? Would it be...

4___very often
3___fairly often
2___now and then
1___seldom
0___never

46 How much do you think scientists in your field and the administration of the College of Agriculture agree with how often you should publish your research findings? Do they...

0___agree completely
1___agree in general
2___sometimes agree, sometimes not
3___disagree in general
4___disagree completely

47 How much does your attendance at faculty meetings or at other university committee meetings interfere with your research. Would it be...

3___a great deal
2___quite a bit
1___just a little
0___not at all

48 How much do other non-research duties in the College of Agriculture interfere with the attainment of your professional goals as a scientist? Would it be...

3___a great deal
2___quite a bit
1___just a little
0___not at all

49 How different do the aims of the College of Agriculture seem from those of your scientific discipline? Would they be...

3___a great deal different
2___quite a bit different
1___just a little different
0___not at all different

50 How much do scientists in your field disagree with university administrators on the percentage of time you should spend doing research? Would it be...

3___a great deal
2___quite a bit
1___just a little
0___not at all

51 Many members of the College of Agriculture hold joint appointments with responsibilities in research, extension, and teaching. In your case, considering the attainment of your professional goals, do you find this system...

0___very helpful
1___helpful
2___neither helpful nor a hindrance
3___a hindrance
4___a great hindrance

53 How often do you talk to the following kinds of people about your Research?

Department Head

___several times a week
___about once a week
___once or twice a month
___less than once a month

Other Administrators

___several times a week
___about once a week
___once or twice a month
___less than once a month

Commercial Researchers

___several times a week
___about once a week
___once or twice a month
___less than once a month

U.S.D.A. Researchers

___several times a week
___about once a week
___once or twice a month
___less than once a month

Fellow Researchers On-Campus

___several times a week
___about once a week
___once or twice a month
___less than once a month

Fellow Researchers Off-Campus

___several times a week
___about once a week
___once or twice a month
___less than once a month

Extension Specialists

___several times a week
___about once a week
___once or twice a month
___less than once a month

Extension Agents

___several times a week
___about once a week
___once or twice a month
___less than once a month

Farmers or Practical Users of Your Findings

___several times a week
___about once a week
___once or twice a month
___less than once a month

Appendix B

Covering Letter Enclosed with Questionnaire

APPENDIX B

Covering Letter Enclosed with Questionnaire

Agricultural Liaison Unit,
C.S.I.R.O.,
372 Albert Street,
East Melbourne, Victoria.
Australia.

September 1964

Dear Scientist:

I'm Stuart Hawkins of the Commonwealth Scientific and Industrial Research Organization of Australia. At present I'm working in the graduate program of the Department of Communication of Michigan State University.

In common with other scientific institutions around the world, our Organization is very much interested in how researchers communicate their findings. With this is mind I am conducting a limited survey of the communication behavior of agricultural scientists in some land-grant colleges. I regret that, owing to limitations of time and finance, I will not be able to visit with you personally.

I would very much appreciate it if you could spare about 15 minutes of your time to complete this questionnaire and return it to the address below:

H.S. Hawkins
Department of Communication
322 Union
Michigan State University
East Lansing, Michigan 48823.

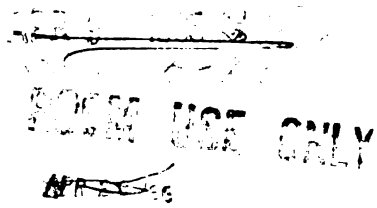
Naturally all individual replies will be treated as confidential and will be used solely for compilation of group data.

Thanking you in anticipation of your cooperation.

Yours sincerely,

Enc: Stamped, addressed envelope

H.S. Hawkins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