ABSTRACT
        An attempt is made in this paper to characterize, and
identify some of the basic issues in library research which require
resolution. DeProspo's primary purpose is to suggest some of the
reasons which lead to the conclusion that much of the research effort
in librarianship, the objective of which has been to influence
library policy, has been ineffectual. The practicing librarian, who
has participated in assisting the library researcher, has probably
benefited the least. The library researcher must learn to communicate
with the library policymaker on some equal basis. If he continues to
talk only to himself or to other researchers, research efforts are
not likely to contribute toward the solutions of some of the pressing
and growing problems confronting the library. This paper is not
directed exclusively at those actively engaged in conducting
research. The target group includes the library policymaker who has
successfully withstood efforts by the researcher to influence his
approaches to "business as usual." An objective of the paper is to
suggest some of the reasons for the distrust of the librarian of the
library researcher and some of the steps which might reduce that
distrust. Voos takes a brief look at research in information science.
(Related documents are LI 004 461 and LI 004 462.) (Author/SJ)

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THE LIBRARY RESEARCHER AND POLICYMAKER

An Observation Here, A Speculation There

by Ernest R. DeProspo
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AND

COMMENTS ON RESEARCH IN THE INFORMATION SCIENCES

by Henry Voos
Rutgers University

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Preface

The genesis of this paper evolved out of a series of meetings
with the Library Research Round Table 1972 Program Committee, dating
back to the January A.L.A. Midwinter Meeting. The intellectual
stimulus and encouragement of Barbara Slanker, Program Chairman,
and Josh Smith, Program Committeeman, provided the much needed
push to "stay with it." At first, it was felt that a position
paper on the need for a new library research journal would be use-
ful. We then moved away from that topic to one on the "Present
Status of Research in the field of Library Science." However, as
the committee continued its work and began to home-in on the speci-
fics of the program, it became apparent that the topic needed better
focus.

I finally decided that an attempt to develop a position paper
on the relationship between the library researcher and library
policymaker would be an important start towards getting at some
of the other crucial questions. That decision seemed to make
sense in that one important role for LRRT has been its effort to
improve communications between library researcher and library deci-
sionmaker.

While I recognized that such a position paper would necessar-
ily need to "cover the waterfront," I, nevertheless, wanted to place
some guidelines on the observations and speculations made. Conse-
quently, I asked Dr. Henry Voos, my colleague at Rutgers, to develop

a paper on the researcher in information science. I believe that his paper, "Research in the Information Sciences," very adequately fills that vacuum in my paper.

THE LIBRARY RESEARCHER AND POLICYMAKER--
AN OBSERVATION HERE AND A SPECULATION THERE

Ernest R. DeProspo
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Introduction

Despite the presumption implied by the title of this paper,
I believe that an attempt to characterize and identify some of
the basic issues in library research which require resolution is
useful. My primary purpose is to suggest some of the reasons
which bring me to the conclusion that much of the research effort
in librarianship whose objective has been to influence library
policy has been ineffectual. Whatever the motive, the practicing
librarian (from top to bottom in the library organization), who
has participated in assisting the library researcher, has probably
benefited the least. The library researcher must learn to commu-
nicate with the library policymaker on some equal basis. If he
continues to talk only to himself or to other researchers, re-
search efforts are not likely to contribute toward the solutions
of some of the pressing and growing problems confronting the
library today and for the foreseeable future.

This paper is not directed exclusively at those actively
engaged in conducting research. My target group includes the
library policymaker who has successfully withstood efforts by the
researcher to influence his approaches to "business as usual." And,
I believe, that more often than not such "strategy" by the librar-
ian has been warranted. Again, an objective of the paper is to

suggest some of the reasons for the distrust of the librarian of the library researcher and some of the steps which might reduce that distrust.

Which areas of research need top priority, or which methodology and techniques should be or must be used are issues beyond the purview of this paper. For the latter, at least, the literature abounds. Nor do I casually cast stones at the library researcher (for, of course, I am one of them). And, while the situation as I see it is obviously complex, I don't plan to explain it away or justify its existence by concluding: "It's too complex and most of you probably won't understand it." If I am accused of oversimplification, so be it, but I believe that the issue is serious enough to warrant that risk. My values and bias should become clear very quickly. Much of what I want to say is speculative. Obviously, though, my own research efforts in the field have influenced my thinking on the matter.

As a final introductory comment, I suggest that the question of a new journal does not provide any clarity into the overriding issues. The question adds fuel to the fire but not very much light. Whether or not we need another journal is really very much beside the point. What we do need is open and honest debate on how well or poorly policy research in librarianship has progressed with some thoughts on the why of the "state of the art."

The Mainstream of Library Research

In my attempt to pull together a number of varied and often
elusive ideas for this paper, I have asked colleagues and students
if they could identify library research which had significantly
influenced library policy and practice. None were able to respond
in any satisfactory way. Most of them suggested that "biblio-
graphic" research had made an impact. Also, technical studies
which have dealt with "physical" problems were significant. Others
suggested that a survey here and there might have been influential,
although they weren't sure that such surveys came under the label
of research! The point is that we are indeed pressed to find good
examples of a direct connection between research intended to influ-
ence policy and such policy. Why?

In part the answer may rest with some of the assumptions we
have been making. Those of us who have accepted the label of
"researcher" have generally accepted the following assumptions as
given:

1. Research is good--inherently;

2. Research is, therefore, acceptable;

3. Research is, therefore, understood;

4. Research is, therefore, useful;

5. Research is, therefore, desirable and wanted.

In part, too, its ineffectiveness rests with the rather late
arrival of research as a "thing to do" in librarianship. The
inevitable lag in developing conceptual and theoretical bases has
tended to produce some natural responses,/i.e. general suspicion and

distrust of the researcher. Some consequences have been:

1. Narrow definition of "acceptable" or "legitimate" re-
    search.

2. Over- and under-utilization of rigorous approaches in
    both methodology and technique--a general insecurity in
    approach.

3. Closed system of sharing of mutual data bases, as well
    as results.

4. Hesitancy to borrow and use those findings and/or
    approaches appropriate to the problems under investiga-
    tion, but no hesitancy to emulate the "scientific" mode.

Finally, one might suggest that in the profession (although
certainly not peculiar to t) non-empirically based studies have
tended to counter-influence the empirically based ones. Today,
for example, we wrestle with the problem of "system" (large
library operations in general) largely, I think, because the notion
of "system" evolved out of an assertion that library system is
good and preferable. At some point the assertion was declared
fact. What should be remembered, however, is that the original
assertion was never empirically based. Empirically-based efforts
which suggest that a reconsideration of "system" is needed have
been overwhelmingly rejected in the field.

Research in librarianship undoubtedly received its greatest
impetus with the "grand experiment" at the Graduate Library School,
University of Chicago. The excitement, interest, and activity
generated during that period of time will probably never be

experienced again. Yet, the "Great Promise" has never been ful-
filled. The influence on basic library policy has been minimal.
The profound observation of a Joeckel, as modern today as it was
pertinent then, remains unheeded. The "Great Promise" produced
invididuals prepared to go out and look at specific things. As
that approach set the pattern, no overall effort to develop con-
ceptual/theoretical bases (i.e., general laws) was ever really
made or, more importantly, seen as necessary. And, since the
public institution has never really needed to use these "specific
things," there was no need to support basic research.

The "specific things" to which I refer are epitomized in the
super-abundance of library surveys. I am sure that you can cite
the numerous products which flowed either directly or indirectly
from the influence of the "Great Promise," e.g., L. R. Wilson,
The Geography of Reading: A Study of the Distribution and Status
of Libraries in the United States (1938); Wilson, Branscomb,
Dunbar and Lee: A Survey of the University of Georgia Library
(1939); Joeckel and Carnovsky: A Metropolitan Library in Action
(1940).

I am sure that the reader could cite the long list of studies
which have come about either as a direct or indirect influence of
the Graduate Library School. And, I am equally convinced that the
reader would be challenged to locate any systematic pattern of
positive influence, as reflected in the ways libraries are operated,
as a consequence. I see no fundamental change in this condition of
minimal impact which library research has had on the profession.

If anything, negative attitudes on the part of the practicing librarian have become increasingly rigid. The utilization of the "consultant" or "outside expert," who has too often legitimized preconceived conclusions, is the most commonly used and most highly influential outside force on library policy.[1]

A reasonable conclusion, although difficult for many of us to accept, is that no public agency really needs research in order to function. There is no guarantee that the current state of placing increased accountability on the public policymaker is more than rhetoric for the public. The fact remains that there will always be some public officer who will ask the unanswerable question. And, even when an answer exists, there is no guarantee that having it really changes anything. Historically, the public policymaker has never really needed to utilize empirically based research. Problems typically come to him as specifics, e.g., "x" dollars cut from the budget, so "which journal won't be ordered?"

On the other hand, the researcher typically will pursue problem-solving with a very different set of factors at play, e.g, money or data available or its usefulness to some student. The importance of the problem or his interest in the problem may have little to do with whether or not he pursues it. Clearly, if

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[1]Why, for example, did Columbia University Library go to the outside consultant group, completely bypassing the Library School at Columbia, for its self-study? Is the library researcher incapable of conducting such a study? Are his efforts less legitimate than the consulting firm? Does that decision represent a basic distrust by both the library policymaker and the university policymakers of the library researcher, or is it that the library researcher may not provide acceptable findings?

research is theoretically oriented, it is not likely to be sup-
ported, financially, by the federal government or private research
foundations!

It should come as no surprise, then, that library policy-
makers have come to distrust and/or pay little attention to the
researcher. The inapplicability of what the policymaker sees as
research tends to reinforce his already predisposed inclination
to disdain the efforts of the researcher. In general, the litera-
ture which the policymaker is likely to read (assuming he finds
the time to read) is grossly remiss in not containing information
which could assist him in distinguishing between the "better"
and "less useful" research product. Further, little if any attempt
has been made to translate the more complex research products for
the policymaker's consumption into language appropriate to the
policymaker's needs.

The library researcher (again I accept from anyone that self-
appointed label) continues to talk either to himself or other re-
searchers. He still tends to perpetuate the "mystique" of the
research process, in terms of style, language, technique, and
intent, or he has done very little to place the process in the
proper context.

Scientific and Policy Value Research

It has been a common phenomenon in our society for profes-
sional groups, in general, to resist the establishment of "norms"
based on empirical findings. As suggested earlier, the acceptable
pattern was one in which the "researcher" dealt with specific things.

One consequence was the attempt of the researcher to find legitimacy in his work. One could characterize much of the initial effort as "pseudo-scientific," emulating other disciplines which seemed more exact. One writer, referring to educational research (she could just as well have been writing about library research) notes:

> The past was characterized by poorly stated research
> questions forced into ill-fitting research plans with
> correlation coefficients reported to an inappropri-
> ately fastidious third decimal place. Today the trend
> is toward greater innovation in asking questions and in
> designing research to explore them. A less pedantic
> reliance on form, combined with greater understanding
> of the methods of science, has led to increased regard
> for research procedures both innovative and rigorous.
> This experience, if applied, can ensure greater fruit-
> fulness in future educational research. (emphasis mine).[1]

Hopefully that is the trend; and, hopefully, the researcher in librarianship is beginning to apply that approach suggested by Roberts. However, in my judgment, arriving at that "stage of research development" requires that an important distinction between "scientific value" and "policy value" research (to borrow the terms used by William Paisley) is made and understood. Scientific value research is concerned with a basic understanding of a phenomenon or process, regardless of its application to immediate, practical decisions. Policy value research is directly concerned with its application to immediate, practical decisions.

Commonly, scientific value research is achieved at the expense of policy value research since the conditions and variables

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[1] Karlene H. Roberts, UNDERSTANDING RESEARCH: SOME THOUGHTS
ON EVALUATING COMPLETED EDUCATIONAL PROJECTS, (Stanford, Calif.,
ERIC at Stanford, 1969), p. 1.

of that process are defined abstractly rather than concretely.
Policy value research must establish definitions which are very
specific to the situation or problem. That is, policy value
research recognizes that the more sharply the stuoy focuses on
a single situation, the more likely it will have import for deci-
sions specific to that situation.

In library research the dilemma has been our inability to
establish a viable balance or "trade-off" between the two re-
search objectives. The absence of general laws binding behavior
in one situation to behavior in another situation has produced a
kino of schizophrenia in the researcher, as he aimlessly shifts
from one approach to the other, never quite ible to conquer the
delicate balance between the two. Consequently, the decision to
study a single situation has usually oeen a decision against scien-
tific value research.

Basically, then, policy value research has as a primary
objective the improvement of the decisions of the policymaker.
It is ironic, then, that there is so little evidence to support
the conclusion that tne library policymaker has utilized such
assistance on any systematic basis.

The absence of generalizable laws has circumventeo policy
value efforts in librarianships. Reliance on the research
finding is missing since we cannot "oeduce" from the general law
to the specific situation. Yet, the liorary policymaker remains
willing and reaoy to rely on "pseuoo-oeductive" bases for his
decisionmaking approach to probiem solving. In essence, .ie
library "standards" have served as that pseudo-deductive model.
Cursory examination quickly reveals that this model is non-

empirically based, houses innumerous unstated assumptions, and substitutes assertion for fact. Only recently have some of the weaknesses of that model for decisionmaking become evident. (During periods of extended affluence it is apparent that almost any model of decisionmaking will do for the public policymaker).

The research process involves the systematic gathering of selected facts and the interpretation of those facts in the light of some specified objective or set of objectives. A concern of research is the gathering of intelligence and reducing risk-taking, i.e., seeking knowledge. The process is cyclical, starting with values and ending with, presumably, insights which then lead to further research. The decision as to which problems constitute worthwhile "scientific value" research rests solely with the individual; conversely, that decision for "policy value" research usually rests elsewhere. In either case, severe a critical self-examination of his means and his objectives is the researcher's most appropriate guide.

The deductive approach, particularly prevalent in policy value research, at least in form, is a perfectly legitimate research approach IF a "general law" exists from which one could deduce or to which one could generalize from the particular event. That is, the individual situation does not validate the generalization but guides its formation and testing. The specific thing provides meaning, not truth. A "law" requires repeatability in that it formulates a basis for constant recurrence. How one conceives of the specific is a product of generalizations.

We should recognize the obvious that general laws are hard
to come by, and then proceed with the task at hand. Attempts
to purify the research process through the assumption of some
existent general law have slowed down that process, if not con-
taminated it through intellectual dishonesty. That is, efforts
to be "scientific," even if not possible nor necessary, have
generated some widespread distrust of the process itself. The
fact is that in most of what constitutes the Environment of
library research, our knowledge is virtually all in the form of
quasi-laws, at best. But if we cannot, in the present state of
our knowledge, explain the exceptions to the specific cases, it
surely does not follow that we know nothing at all. The primary
limitation of the particular or semi-deductive approach is this:
if particular, it is said to have established a "fact"; and,
if general, it is said to have established a "law." we need
not camouflage, and, therefore, distort the process through
pseudo-scientific methodologies.

The researcher's attempt to answer the basic "scientific"
question, "What the devil is going on around here?" requires
open, honest, and realistic approaches. Perhaps the analogy of
the "drunkard's search" is appropriate. Abraham Kaplan tells
the story of the drunkard searching under a street lamp for his
house key, which he had dropped some distance away. Asked why
he didn't look where he had dropped it, he replied: "It's
lighter here!" But, as Kaplan notes:

> ... the joke may be on us. It may be sensible to
> look first in an unlikely place just because "it's
> lighter there." We might reasonably entertain one
> hypothesis rather than another because it is easier
> to refute if false, or because it will eliminate
> a greater number of possibilities, or because it
> will show us more clearly what steps to take next.[1]

Research, then, is any conscious, premeditated inquiry,
any investigation which tries to increase one's knowledge of
a given situation. In that context, theory becomes significant
in that it represents a tentative logical explanation of the
network of relationships in a large body of individual situ-
ations. It has the role of "yet to be tested." To say that
it may be good in theory but it doesn't work in practice is a
contradiction in terms. If it does not work in practice over a
reasonable span of cases, then it is not good theory. To be
good theory means the explanation offered does work in prac-
tice and has verification in fact and in real life, or at least
is subject to revision and re-testing.

The library researcher must accept openly the reality that
while he can reduce the extent to which he is infected by the
society or institution studied, he cannot eliminate infection.
Some variety of truths is to be expected. Here we witness the
pressure from the one side (the so-called scientific) to be
neutral and unhumanly objective in the research pursuit; and,
from the other side (the solve-my-special-problem group)

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[1] Abraham Kaplan: THE CONDUCT OF INQUIRY, (San Francisco,
Chandler Publishing Co., 1964), p. 17.

pressure to come up with the prescribed answer, or at least the
most likely acceptable one. Perhaps the better balanced approach
is the one in which the researcher accepts the role as an active
agent in problem identity and solving.

If we want to share a common view of research with those
in the environment under study, as I believe we must if communi-
cation is to become a reality, then it is essential that the
library researcher remove the mystique of the detached referee
who bases his judgment on a set of universal theories (which
don't exist anyway!). Rather, the researcher concerned with
influencing library policy should be viewed as an active engineer
of social change in directions freely chosen by each community
of interests. As such, his ability to play this role will be
partly determined by his own identification with his adopted
community and with its aims. That situation, obviously, requires
active and open communication between the various parties.

Again, if my earlier point is correct, i.e., the library
researcher has not yet learned how or recognized the need to
communicate to the library policymaker, then the role of active
agent is not possible or likely. To hide behind the mystique
of the research operation may have placed the researcher in a
position of weakness--if not intellectual ridicule. We should
carefully examine the comment made by P. H. Cook some twenty
years ago:

> There may be an uneasy recognition of the existence
> of major problems, indeed problems closely related
> to the subject of the research, but considerable

anxiety associated with the task of tackling them.
The advent of the research worker is hailed as providing an apparently painless way out of this conflict:
executive authority may be under pressure to do
something about problems that can no longer be
avoided; it accepts research, therefore, in the
hope that this will postpone indefinitely the need
for action. Research, then, may be used as a
neurotic escape from the need for facing up to
problems.[1]

Research so conducted, that is, responding equally poorly

from both sides, has been allotted a rather depressed status.

It is considered neither hard-headed enough for the practical

nor scholarly enough for full acceptance in academic circles.

The Relationship Between Researcher and Policymaker

The pattern of library research remains largely pseudo-

deductive, thing-oriented, and non-pragmatic. To understand

this pattern better and to explore some explanations for it,

it is necessary and important to distinguish between two basic

components of research: (1) the Environment of the research

process, and (2) the View of the research process.

The Environment is easy to identify. It is, of course,

the world of libraries and librarians. However, the View of

research is a more complex and elusive concept. Three primary

elements (for basic and simplistic illustration) constitute the

View: (1) I DO research, (2) I LIKE research, and (3) I

UNDERSTAND research. These three conditions are not automati-

cally or necessarily inter-related. In fact, a key factor is

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[1]P. H. Cook, "Methods of Field Research," Australian Journal of Psychology, 3 (2), 1951, p. 90.

the apparent lack of relationship. For the researcher, it is important that he _do_ (obviously) and _understand_ research. Of course, it is preferable to "like" it also, but not critical.

Un the other hand, for the library policymaker, what is important is that he _understand_ research--at least to the extent that he can interpret findings for input into his decision-making process. The other two elements are not critical. Again, of course, it might be a bonus if he liked it. Whether it would also be a bonus if he did it is, I suppose, debatable. I believe that there is the need to place the two major components, Environment and View, in a proper or at least realistic perspective. Then, we have the opportunity of finding ways of bridging the gap between researcher and policymaker.

ENVIRONMENT OF RESEARCH (E)

Symbol

A = Mainstream of librarianship--however defined.

   A_1 = The library policymaker.

B = Library research.

   B_1 = The library researcher.

C = Other research.

   C_1 = Other researchers.

VIEW OF RESEARCH (V)

X = I DO research.

Y = I LIKE research.

Z = I UNDERSTAND research.

Figure I depicts the "ideal" (not necessarily desirable)
relationship between Environment and View.

FIGURE I

Ideal Relationship

$$E = \begin{matrix} A & A_1 \\ B & B_1 \\ C & C_1 \end{matrix}$$

$$V = \begin{matrix} X \\ Y \\ Z \end{matrix}$$
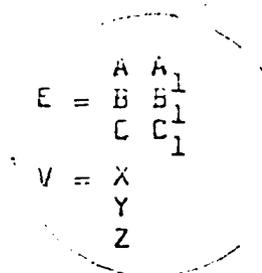
The ideal relationship is one of total integration in
which Environment and View are identical. There are no value
conflicts; agreement exists on goal and objective. There
exists, if you will, perfect harmony.

Figure II represents the relationship between Environment
and View which the library researcher assumes exists. It
depicts the normal modus operandi under which the research
process takes place.

FIGURE II

Assumed Relationship
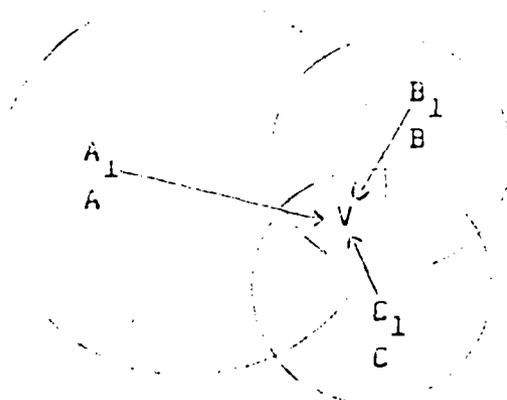
The "assumed" relationship operates on the basis that not only is there a sharing of environment (the obvious) but also a sharing of View (the questioned). The assumed relationship, while recognizing the existence of some conflict and disharmony-- values do conflict here and there--operates under the assumption (usually implicit) that there exists a community of interest. A substantial degree of integration of Environment and View prevails and is functional to the research process. Basically, Figure II suggests that the researcher is both able and does communicate to and with the library policymaker; that research is wanted and understood.

Figure II represents a relationship which the library researcher should not assume to be the case. Rather, Figure III is closer to representing the "real" relationship between the library researcher and library policymaker.

FIGURE III

Real Relationship
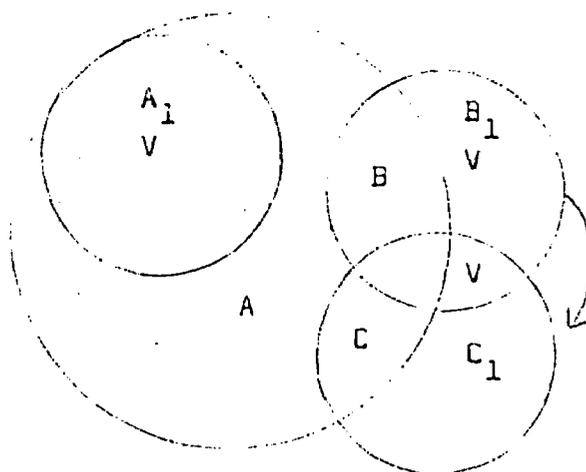
In Figure III one can visualize the basic communication gap
or vacuum between the library researcher and library policy-
maker. We, of course, share part of the same Environment.
What we do not share, though, is the basic View of research.
The library researcher has assumed that the critical element
in the View is the "Y" or I LIKE research, and when effort
has been made to improve the relationship, he has typically
proceeded on the basis of finding ways to share "Y." I be-
lieve that this approach has been counterproductive. The
library policymaker need not like research; he must, though,
understand it better than he now does. The relationship under
Figure II assumes a basic understanding in that "X," "Y", and
"Z" are shared between the researcher and policymaker. The
fact is that more often than not we have been on separate
paths, with the "assumed relationship" exacerbating the gap
between the two and often deterring (since there is not the
existence of a felt need) needed efforts to bridge these dif-
ferent views.

For the "other researcher," it is not relevant or really
important to him whether or not the library policymaker shares
his view of research. He enters the Environment of librarian-
ship for reasons which are primarily important to him. Whether
or not he influences policy is of secondary concern, if of any
concern at all.

At the same time, the library researcher, perhaps ironi-
cally, has tended to emulate the "other researcher's" <u>scientific</u>

approach (especially in terms of methodology and technique).

This emulation may have resulted, in part, from the rather late

start which research has had in the profession. The library

researcher is still striving for legitimacy within the field.

And, while the library researcher often shares a common View

with the "other researcher," he has become the "bastard child."

That is, to the extent that the library researcher wants to

influence library polic·, he has pursued a poor strategy, too

often finding his products illegitimate to both the library

policymaker and other researcher.

Concluding Thought

The "issue" of a new journal, per se, really begs the

question. The disenchantment of both the library researcher

and library policymaker with the resultant breakdown in com-

munication ought to be the focal point from which other factors

or suggested actions emerge. Obviously, various avenues need

exploration. A primary goal should be the translation of

research approaches and findings, particularly policy value

research, into understandable language that is reasonably

clear to the library decisionmaker. An important focus which

highlights those factors which appear especially appropriate

for action is needed. In large part we can achieve this primary

goal through incorporation within the framework of current

journals, if the problem is recognized and seen as important

by those who determine the journal's policy. For example,

special sections within each of the "popular" library journals

could be devoted to this purpose.

Also, more effort at various professional meetings, than
is currently made, can and should be devoted to increasing the
dialogue between the researcher--his purpose, approach and
finding--and the librarian. Library education should be much
more active in preparing both the researcher and the library
policymaker (actual or potential) for participation in this
challenging process.

Finally, it may be that a new journal devoted to the trans-
lation of research findings for policy discussion is necessary.
We shouldn't feel that this need is peculiar to librarian-
ship! .In a recent announcement for a new journal to be intro-
duced by the National Capital Area Chapter of the American
Society for Public Administration, entitled THE BUREAUCRAT,
the publicity release states:

> THE BUREAUCRAT, a new quarterly professional
> journal, is by and for bureaucrats. It will
> analyze major public policy questions and sug-
> gest possible solutions in a READABLE, CONCISE,
> and STRAIGHT-FORWARD fashion.

One can only conclude that for these policymakers the avenues
of communication with the researcher have become pretty well
closed!

The fact is that those who accept the label of "researcher"
must be more willing than they have been to find better ways
of selling their products; more willing to reduce the mystique
of the research process; more willing to report their failures;

and more willing to apprise the library policymaker of some of

the risks involved in the policymaker's efforts to put the

findings into practice.

RESEARCH IN THE INFORMATION SCIENCES

Henry Voos

It is difficult to take a position on research in a discipline that, although

adolescent, seems still to be in the birth throes of definition. [1,2] The foregoing

references are just two of many concerning this issue of definition of informatiin

science. In order to look at the research in a discipline, a definition of that

discipline must be accepted. A recent issue of the NEW YORKER contained an article

which discussed the purity of a discipline, and provided two standards which informa-

tion science may not have met, primarily because it is not a pure discipline:

> There are two simple and ruthless ethical standards by which
> the purity of any discipline can be determied....What is
> required is, first, an institutionalized indifference to men
> whose work has been completed--a disregard or contempt for
> for those who have accomplished much but who have lost the
> will to create and whose major accomplishments are of the
> past..... What is also required is the institutionalized
> conviction that accomplishment is important only if it
> advances the discipline in some significant way. Competition
> must exist for creative achievement only -- with and for the
> discipline itself, rather than with competitors.[3]

For the sake of argument, we will use the definition currently used by the

American Society for Information Science:

> The science that investigates the properties and behavior of
> information, the forces governing the flow of information,
> and the means of processing information for optimum accessibility
> and usability. The processes include the origination, dissemina-
> tion, collection, organization, storage, retrieval, interpretation,
> and use of information. The field is derived from or related to
> mathematics, logic, linguistics, psychology, computer technology,
> operations research, the graphic arts, communications, library
> science, management, and some other fields. [4]

The field may be said to be multidisciplinary rather than interdisciplinary, or pure.

A second facet of this paper is an acceptable definition of research. Some of

the problems in attitude toward research in a multidisciplinary field are:

> For the domain of truth has no fixed boundaries within it....Each
> discipline may take from others techniques, concepts, laws, data,
> models, theories, or explanations -- in short, whatever it finds
> useful in its own inquiries.[5]

> ...in contemporary behavioral science the attitude toward experimentation
> is in danger of becoming a kind of ritualism, as though the laying on of
> hands can itself effect a cure of diseased ideas. As with all rituals,
> the emphasis passes from content to form, from substantive questions to
> procedural ones, and virtue comes to be localized in the proper performance
> of fixed act sequences. Particular techniques are identified with "the
> scientific method", and inquiries in which those techniques are not employed
> are then dismissed as having no scientific significance....Observation
> remains basic to all science, but not all observation must be carried out
> by fully developed experimentation. 6

The above provides the context within which research in the "discipline" of

information science must be viewed. We will adopt one of the dictionary defini-

tions of research:

> ...critical and exhaustive investigation or experimentation having for
> its aim the discovery of new facts and their correct interpretation, the
> revision of accepted conclusions, theories, or laws in the light of newly
> discovered facts, or the practical applications of such new or revised
> conclusions, theories or laws. 7

Such a definition provides a wide latitude for evaluation.

One of the products by which research is sometimes measured is publication.
8,9
We can trace publication and its authors by volume, or by the citation patterns
10
exhibited.   Another method recently used for tracing research patterns was proposed
11
in the field of mathematics.   One can also examine the extant research and evaluate

it in terms of meaning or contribution to the discipline, and/or for its research design.

Publication patterns: To determine whether multiplicity of publication has any relationship to being cited was one way to test the assessment of research occurring in the information sciences. INFORMATION SCIENCE ABSTRACTS was checked between 1966 and 1970. The results are shown in Table I below:

TABLE I
Authors Publishing One or More Times
1966-1970

No. of Pubns.	1966		1967		1968		1969		1970		$\bar{X}$
	N	%	N	%	N	%	N	%	N	%	
1	1131	88.2	1182	88.3	1454	87.3	2832	88.3	3045	86.7	87.8
2	109	8.5	120	9.0	148	8.9	268	8.3	299	8.5	8.6
3	29	2.3	26	1.9	45	2.7	53	1.7	102	2.9	2.3
4	5	.4	10	.7	9	.5	28	.9	31	.9	.7
5	4	.3			3	.2	10	.3	18	.5	.3
6	2	.1			1	.1	10	.3	6	.2	.2
7	2	.1					1	*	1	*	
8			1	.1					2	*	
9									3	.1	
10					6	.3	4	.1	5	.1	.2
Total**	1282		339+4.4		1666+24.4		3206+92.4		3512+9.5		

%Change
* Less than .1%
**Does not include those people who wrote no articles at all.

The percentage of authors who wrote two or more articles ranges from 11.8 to 12.7, averaging 12.0%. DeSolla Price states that one method of measuring productivity is to take the square root of the number of authors having written. This provides an order of magnitude for high producers. For 1966 this would be authors producing more than three papers, for 1967 those producing more than two papers, for 1968 and 1969 those producing more than three papers, and for 1970 those producing more than four papers. Percentage-wide the number of authors falling into this category for 1966 through 1970 respectively is 1.2, 2.7, 2.4, 1.6, and 1.7. As de Solla Price so aptly warns although there is no guarantee that the samall producer is a nonentity and the big producer a distinguished

scientist, there is a strong correlation, and we are interested in looking deeper
into the relative distribution of big-and small-output writers. [11] [12] Another way
of looking at this is to apply Lotka's law,modified, which states that the number
of people writing n papers is equal to $1/n^2$. If information science behaved
similarly to the natural sciences, we could therefore expect that the number of
authors producing exactly two(2) papers would be 25% or 320 for 1966, the number
expected producing exactly three papers would be 11%, or 142 for 1966. It becomes
obvious that the behavior of the information sciences has probably a different law
governing it. A close approximation might be $1/n^{3.5}$. However, it does seem that
a smaller proportion of authors write more than one paper than those in the hard
sciences.

Information Science Abstracts was examined to determine who the authors were
who published more than one paper. A comparison was then made of the journals
indexed in INFORMATION SCIENCE ABSTRACTS with those picked up in the SCIENCE
CITATION INDEX in order to determine whether writing many papers increased the
number of citations to those papers beyond the normal expectation. The journals
in both the aforementioned secondary publications did not differ significantly so
that this test could be made. The use of the X^2 method for testing the significant
linkages through citations is cited in Parker, Paisley and Garrett's BIBLIOGRAPHIC
CITATIONS AS UNOBSTRUSIVE MEASURES OF SCIENTIFIC COMMUNICATION. [13] After performing
the test it was found that we must accept the null hypothesis at the .005 level of
significance that there is no relationship between the number of papers published
and the number of times an author is cited, although one would expect, on probability
of visibility alone, that there would be a relationship.

Indiana University in investigating the research needs in information and
library science did a content analysis of INFORMATION SCIENCE ABSTRACTS CISA for
1970 and found a "rather surprisingly close fit of the two distributions, one of
research projects, the other of publications...that...may give a fairly good picture

14

of what is currently being done in our field." The authors go on to analyze

the incidence of occurrance of the various subject categories in ISA: Infor-

mation Science-Documentation (8.3%); Information Centers and Libraries (17.3%);

Specialized Information Services and Systems (13.8%); Information Generation,

Dissemination, Collection (5.8%); Information Publishing and Reproduction (1.8%);

Information Identification and Translation (3.5%); Analysis of Information (12.5%);

Storing and Retrieving of Information (16.8%); Utilization of Information (3.8%);

Supporting Research (16.4%). One can take this data and rank the research effort

as follows:

RANK	TASK
1	Information Centers and Libraries
2	Storing and Retrieving of Information
3	Supporting Research
4	Specialized Information Services and Systems
5	Analysis of Information
6	Information Science - Documentation
7	Information Generation, Dissemination, Collection
8	Utilization of Information
9	Information Identification and Translation
10	Information Publishing and Reproduction

Within our difinition of research it would seem that the applications areas seem

to be receiving more attention than the theoretical areas.

Another approach is to look at the tables of contents of the ANNUAL REVIEW OF

INFORMATION SCIENCE AND TECHNOLOGY (ARIST),v.1-6. One can see if and where the

same interests continue and also compare the nubmer of references pertinent to

each chapter versus time. One must assume that the authors have similar capabilities.

Table II below has done this:

TABLE II

COMPARISON OF SUBJECTS AND NO. OF REFERENCE/SUBJECT ARIST,V.1-6

CHAPTER TITLES	ARIST VOLUMES					
	1	2	3	4	5	6
Information Needs and Uses	23	38	68	58	114	109
Professional Aspects....	90	64	155	103		40

CHAPTER TITLES	ARIST VOLUMES					
	1	2	3	4	5	6
Content Analysis	177	146	133	173 #	96	50
File Organization	97	135	94	150	54	
Automated Language Processing	116	121	142	115		131
Eval. Ind. Sys. (ind. & Abs.)	110			106		133
Hardware Dev.	129	154				
Man-Mach. Comm.	99	109	153			
Library Auto.	66	83		151	182	202
Natl. Issues and Trends	25	90				
Applications (Genl.)	101					
Info. Centers	73	*				
Design of Sys. & Serv.		64	201	181	134	81
Evaluation of Sys. & Serv.		52	**	**	**	**
Chem. Compounds		179				
Appl. (Med.)		147	187			156
Publ. & Distr.		212	48		100	
Tech. Proc. Auto.		51				
Doc. Retr. In Lib. & Info Ctrs			78	80		101
Networks			190	145		****
Appl. (Educ.)			165			
Doc. Diss.				139	##	***
Intnl. Transfer of Info.				55		342
Lib. & Info. Ctr. Mgt.				118	88	
Comm. Techn.					92	57
Reprography & Micro.				80	94	219
Current Awareness					144	

CHAPTER TITLES	ARIST VOLUMES					
	1	2	3	4	5	6
Management I.S.				105		
State & Local Govt. Info. Sys.				71		
Applications (Law)						71
TOTALS	1106	1645	1614	1654	1274	1692

*Combined with Libr. Auto   # Incl. Mgt. Info. Sys.
**Combined with Design   ##Incl. Current Awareness
***Combined with Doc. Diss.
****Combined with Intnl. Trans. of Info.

Note that the nubjer of references does not vary appreciably from year to year.

Some tentative conclusions might be drawn from this summation. As an area of

research, that into the behavior of users has grown steadily over the years; that

discussion on professional aspects seems to have peaked and is on the wane; interest

in content analysis seems to be decreasing; file organization and management has

its ups and downs; automated language processing has remained relatively stable in

its research or publication effort; interest in both library and information center

automation and in man-machine communications seems to be increasing; design and

evaluation of services and systems seems to be decreasing; and research in reprography

and microforms seems to be increasing.

Criticisms levelled at the research have always been aimed at the experimental

design or the sample size. However, what seems to have been usually overlooked is

the time lag between the basic research and the applied research. For example, in

a verbal communciation, a number of years ago, when the National Science Foundation

was reorganized, a decision was made to not fund those projects that had been getting

money because there was no evidence that the research ever bore fruit. Yet, one

realizes that the ordinary R&D cycle has a ten to twelve year span.

If one looks at some of the pioneers in information science research by observ-

ing both what has happened in terms of their being cited, and what is happening

generally one can see the effect of the time lag.

Table III below has the names of some of the people who have provided milestones in
information science in the view of this author:

TABLE III
CITATION TO PAPERS BY INFORMATION
SCIENCE RESEARCHERS, 1966-1970*

NAME	1966	1967	1968	1969	1970
Cleverdon,C	20	20	41	26	42
Luhn, H.P.	34	17	16	29	15
Shannon, W.					1
Taube, M.	14	32	25	19	16

Cleverdon's relevance and recall and testing methods are still heavily cited
and used,e.g. Salton's work. Luhn's selective dissemination of information and
keywork-in context-indexing has supplied much food for thought. It is surprising
that Shannon's information theory as applied to information science, to linguistics
and to compression is not more cited.

An examination of authors who have written five or more papers annually and
appear in the indexes between 1966 and Sept. 1971 were also looked at:

Alan Rees	(1966,1968,1969)
Fred Kilhour	(1966,1970)
V.M. Pings	(1968-1970)
Avram, H.D.	(1969,1970)
Gopinath,M.A.	(1969,1970)
Salton, G.	(1966,1970)
Neelameghan,A.	(1968,1970)
Ranganathan,S.R.	(1969,1970)

The number of author's writing five or more papers has increased, although this may
be due to increased indexing. 1966 (7), 1967 (1), 1968 (10), 1969 (20), 1970(29).

It would seem that from 1968 on the number of authors writing five or more
papers increases by 10. This will have to be observed further.

What has been presented so far is really looking at what has happened in
information science research as measured by publication and citation without looking
at the content of the papers themselves. Much of the literature speaks to methodology,
much of it is redundant, but there are kernels of the future showing up. Increased

attention to microform research, COM and CIM are merging with other technologies such as holography to lead us into investigating storage mechnaisms. Compression or the need for increased storage has shown itself in the researches of Ruecking and Kilgour. User needs, and collection building, and architecture for the best use of the facilities by hymans is appearing.

A cross-check was also made on the ARIST citations to determine whether the quantitative increases or decreases were relative to the total number of items cited for that volume, and generally speaking they were.

The application of research theories from the fields of psychology, economics, seem to be areas in which the multidisciplinary field is aiming itself at this time. However, the application and time lag between theory and practice is an area for further study.

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