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THE PLACE OF THE RESEARCH ASSISTANT IN THE ORGANISATION
AND CONDUCT OF RESEARCH PROJECTS

Robert O'Connor

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In 1973 the Ford Foundation made available some money for economic and social research in Ireland. The grant was to cover a period of three years. In the first year, (1973), some 15 projects were funded while in the second year funds for a further four projects were sanctioned. The remainder of the money will be awarded next year.

As the total amount of money available was rather limited the amount which could be awarded for each project was relatively small - about sufficient to cover data collection and salaries of research assistants. Overhead costs, including the salaries of applicants, have to be borne by the institutions to which the applicants are attached. In these circumstances there is a danger that too much of the work will be delegated to the research assistants. The committee feel that if this happens the research will not be of a good standard and accordingly the present meeting has been called to discuss in a general manner the best methods of dealing with research projects of the kind under review, and in particular with research assistants.

I have been given the task of opening the discussion. Most of what I have to say will be well known to the more experienced members of the audience, but I am sure that some of the statements will prove controversial and so should provoke a useful discussion.

General Ideas

Normally those employed as research assistants are honours graduates, and because of this many people think that they should be able to go ahead with research projects on their own with the minimum of assistance from supervisors. This is a mistaken view. After all, teachers are given special training before being allowed to

take up duty. In business or the Civil Service young graduates are given safe jobs and are carefully supervised so that their inevitable mistakes will not prove too costly. How then can we expect inexperienced people to do good research without any special post-graduate or "on the job" training? In my opinion many people who should know better think that research is easy work and believe that even if badly performed no great harm will ensue anyhow. These are again mistaken views. Anybody who has done research knows that it is not easy work and few realise how really damaging bad research can be.

The least harm often occurs when the project is left uncompleted. In this case of course the research funds are wasted, which is serious enough, but not necessarily catastrophic. The real harm occurs when the research is done badly, producing misleading results which may be propagated widely. Though we are not always aware of it, research results are taken very seriously by various sections of the public and some results may have a strong influence in the formation of government policy. For this reason our findings have wide ramifications and we must always try to ensure that the work is competently done.

We must of course consider our own image in this regard also. If we do incompetent work our reputations will suffer and the prospects for future funding are not enhanced. The people who pay for research expect value for money and if they are not satisfied with what they get they can "make life difficult". Furthermore a few incompetent jobs could give a bad name to all Irish institutions resulting in future research funds being diverted outside the country altogether. If therefore we accept research funds, we must be prepared to do competent work, and must never delegate projects completely to young inexperienced people no matter how brilliant their academic records.

This does not mean of course that research assistants should not be closely associated with all phases of the projects. The contrary is indeed the case. They must carry a large burden of the work, but at the same time they must be given the support of experienced people at all stages. In my opinion the Ford Foundation grant should be considered as

having two aims; the first as a source of funds for doing useful projects, and the second as providing an opportunity for on the job training of young research workers.

The second aim is probably as important as the first. The availability of a corps of good research workers in a country is of vital importance. They are the people to generate new ideas, to seek out vital areas for study and to attract funds to home institutions which would otherwise go abroad. Hence, time spent on the training of assistants should never be considered as wasteful. If this is to be competently done however, awareness of the necessary qualities and a broad knowledge of the techniques which good research workers employ are vitally important. These are discussed below.

Qualities of Research Workers

A good research worker is in many ways a creative artist, with many skills which cannot be learned in a classroom. In young people these skills are mostly latent although there may be the occasional exception. The skills must therefore be developed through working in a good environment, and if the proper environment is not provided, true potential may never develop. "They cannot raise themselves by their own bootstraps".

Below are listed what I consider to be most important characteristics of a good research worker:

(1) He must be intelligent, have a good memory and a good knowledge of his subject, though he need not necessarily be a very quick thinker. Many excellent research workers are slow thinkers, but given time to contemplate, they can always come up with very good ideas. Unfortunately slow thinkers do not do well at interview boards and very often get turned down in favour of glib answerers, many of whom may not be research material at all. This of course is a hazard which is difficult to overcome, and I have no ready solution to offer, except to say that in ESRI we tend to give heavy weight to good paper qualifications in the selection of research assistants. Usually research workers have time for thought. They are not like lawyers who must think rapidly on the spot.

(2) A research worker must have good judgement, i. e. he must be able to distinguish important from peripheral or trivial questions and he must be able to determine what is the core of a problem.

(3) He must have a great dedication to his art and perseverance in its pursuit. Research is not amenable to a steady 9 - 5 approach but to periods of intense activity frequently interspersed with periods of apparently low activity as ideas germinate. But in reality though the research worker may sometimes sit for hours with his "feet on the desk" he is never off the job day or night. He does not live what we would conventionally call a normal life. As Longfellow says:

"The heights by great men reached and kept,
Were not attained by sudden flight,
For they, while their companions slept,
Were toiling upward in the night,"

Marshall also puts this point very cogently when he says:

"In a few hours of happy inspiration he (the artist) may give utterance to thoughts that exert a perceptible influence on the character of coming generations. But his power of expression has been earned by numberless hours of plodding work in which he had gradually built up an intimate connection between eye and hand."⁽¹⁾

(4) A good research worker must be aware of his own limitations and should not attempt what is outside his capabilities. If he does, the likelihood is that he will become discouraged and achieve nothing. On the other hand he must have firm confidence in his ability to do certain things well, and he must be able to maintain this confidence throughout a project, for research is a lonely and very often a trying occupation. Most projects are ordinary humdrum affairs requiring the collection, classification and analysis of large masses of data; routine work, which sometimes yields no positive results and leads nowhere. Wholtime research workers dread such results and consequently many feel insecure and lonely while engaged on important projects. To overcome this insecurity they try to carry several projects simultaneously, overtax their abilities and very often end up with little to show for time and effort. For such people wholtime research is a frustrating occupation and they should either get out entirely or do research as a sideline to some other occupation.

(1) Marshall, Alfred, Principles of Economics, 8th Edition, MacMillan & Co. Ltd. London, 1962, Footnote on p. 209.

(5) The last but by no means least of the qualities which a good research worker requires, is imagination. Contrary to popular opinion imagination is not some "gift" which flowers on its own without outside help or stimulation. Imagination is certainly a wonderful gift but it needs to be carefully disciplined if it is to result in creative output. One of the best methods of developing imagination in a research worker (apart of course from wide reading) is through careful study of data. For that reason research assistants should be given plenty of work in calculations and construction of tables. Assistants do not always like this and some consider that routine work should be done entirely by clerical assistants. This is not so. All good researchers like to work closely with their data, get the feel of it and in the process develop new ideas from it. Though data are usually collected to test hypotheses, the figures when classified and examined very often suggest other more fruitful theories which could not be developed without study of the data. Indeed if a research assistant does not like working with data he should get out of applied research altogether.

As stated above, reading also helps to develop ideas and imagination, but in the carrying out of projects the reading should be carefully ordered. Too wide a reading at the start of a project can often confuse, leaving inexperienced workers in the position that they cannot figure out how to go about solving their problems. In my view the best plan is to read sparingly at first, to become familiar with the problem for the purpose of developing a study outline. As the work progresses, further reading should be done, but the worker must never let this reading deflect him too far from his original outline. The latter is the path through the forest from which he strays at his peril.

How to Utilise Research Assistants

Different people do things in different ways and in this regard I can do no more than relate my own experience which applies entirely to empiric economic research. Of course no two problems are treated alike but in general when I embark on a project I sit down with my research assistant and we outline the problem or problems to be solved. If he is unfamiliar with the area he goes off and does a little (but not too much) background reading. At the next meeting we talk about his reading and decide on the hypotheses to

be tested, how we will do the testing and in particular specify the dependent variable or variables. We then draw up a list of headings under which the project will be organised. These headings are next put into some kind of order and the assistant then prepares a more lengthy outline, first fleshing out the headings agreed upon, setting down in detail how the work is to be done, the stages in the operation, the data required, how it is to be obtained and so on. This outline is again discussed and agreed upon before proceeding further. I cannot overstress the importance of making a good outline. Though we may have to depart from it many times during the study, nevertheless without it we are completely lost. The next stage is very often a fairly detailed literature review to ensure that the project outline is fully comprehensive. This is usually done by the research assistant.

The method of gathering and handling of data is usually the most tricky phase of a research project and it is in this area that the assistant can most easily go wrong. If data are to be presented it is a good idea to rough out blank tables and graphs before any figures are collected. This is particularly important if a survey has to be carried out. Unless tables are prepared in advance one has only vague ideas of what figures to collect in a survey and since collection of data is very expensive, the aim must be to perform the job correctly the first time. One can never afford a second bite at the cake.

From my own experience I have found that the design of blank tables is outside the capabilities of all but a handful of research assistants. Most assistants seem to think that tables cannot be made without data, though any competent statistician knows that a pile of data is no help at all when it comes to making tables. Tables and graphs are made to show up certain relationships and it is the visualisation of these relationships which present the real challenge. My research assistant and I usually make out the blank tables together, each of us supplementing the other's ideas.

Once blank tables are prepared, the data required to complete them are considered. If they are secondary data we discuss where they are to be obtained, the shortcomings of

the figures and any definitional problems which are known to exist. Research assistants are generally weak on data. They must therefore be made aware at the start of all inherent pitfalls and of the necessity for accuracy in the use of figures. Furthermore it is essential that their work be checked from time to time to see how it is going.

If a survey has to be carried out, elaborate preparations have to be made about sampling, data collection, scrutiny and processing. The sampling is usually left to a statistician but it is a good idea for the research assistant to get involved also. He will learn a good deal from working with an experienced statistician. In my research, the assistant makes a first shot at designing a questionnaire but we usually end up doing the job together with the help of colleagues who are expert in this field. When we have done what we can with the wording of the questionnaire, we pre-code all suitable questions, put other questions in a form in which they can easily be coded and think about a programme which will give the required tables. The pilot survey is then carried out with the research assistant taking a full part, both in this operation, and in briefing field workers for the main survey. When the pilot survey is completed a pilot report is usually written up along the lines proposed for the main report. The writing of this report tells us if we are collecting the proper data and whether some of the data collected could be dispensed with.

When the completed questionnaires start to come in from the field, the research assistant and I go through a sample to see how they are completed, what kind of answers we are getting and what questions are unanswered. At this stage we make decisions as to the answers which should be returned for query and those which should be accepted as they stand.

It is absolutely essential that both supervisor and research assistant stay close to a survey during the whole course of the fieldwork. If they do not, erroneous data and ambiguous answers will be accepted, mistakes in coding will arise and a host of other things may go wrong. Technicians, who are experts in getting field work carried out,

very often know little about the data involved and cannot be expected to spot errors and ambiguities which may be quite obvious to research workers

Having collected and checked the data the next operation is to have it processed and the blank tables completed. If the amount of data is small this operation may be performed manually. If it is a large survey, however, the questionnaires will have to be coded, punched on to cards and programmed. In the ESRI these operations are done in our survey unit but since many of you will not have such a unit you will have to contract out the work. In such cases you should keep in close touch with what is going on to ensure that the operations are properly carried out. During this operation the research assistant can be of great help as most of our modern graduates know a good deal about data processing. This knowledge should be utilised to the fullest extent possible.

Writing up the Results

In the ultimate analysis the success or failure of a research project is judged on the basis of the written report. The way the results are presented is therefore of the utmost importance. Many fine pieces of research have been destroyed by the final document, whereas in the hands of an able communicator indifferent research has been made to appear brilliant. There is a saying in the profession that a good man "can make a little go a long way", and young researchers should note this carefully. They may not be able to push "a little" very far but they certainly should not destroy what is potentially good.

Opinions have changed in recent times about the writing up of results. In the past it was expected that research workers should write up their own results in a form suitable for publication. It was held (and with a certain amount of justification) that if a person could not do this, his research was likely to be defective also.

It is now being recognised, however, that research and writing are two separate disciplines, and it does not follow that a person who is good at one must also be good at

the other. In line with this idea some institutions now employ so called "editors" to help research workers write up their results, and I am reliably informed that the system works very well, even where highly technical writing is concerned. Experienced editors, who are usually university graduates (rather than journalists), can write at whatever level is required by the research workers concerned. They do not always understand what a highly technical article is all about, but despite this, they see that it is structured and written as clearly as possible. The big difficulty is to get good editors of the kind needed. People who write well and are acceptable to research workers are not too plentiful. There are however consultant editors in Britain who are prepared to write up scientific material for clients but I understand that the fees charged are fairly high.

Unfortunately most of us will not have the help of editors and therefore a few words on the subject of writing may not be out of place. Also what I have to say may be useful to the many researchers who derive great personal satisfaction from writing up their own material even if an editor is available. If we have already prepared a good research outline the task of writing up the results is eased greatly. The outline forms a framework around which the writing can be done. Despite what has been said above, however, we will not always have a good outline, particularly if we are using secondary data. In many cases we will have a mass of material and will be faced with the task of putting it together in some kind of coherent manner. This is a daunting job. To be faced with a pile of data and a blank pad of paper is a rather frightening experience even for established writers. How should we proceed in such cases?

As is to be expected different people approach this problem in different ways. Since most research reports are structured in a somewhat similar fashion, a large number of research workers visualise this standard structure for their own documents, and start writing with such an outline in mind. They do little additional preparation knowing that a more detailed structure will evolve as the writing proceeds and as new ideas develop. They are of course correct in this knowledge. A structure will evolve from this somewhat

random approach but it is not likely to be a very well ordered presentation, nor one which lends itself easily to improvement in subsequent drafts.

From my experience, most of the people who adopt this approach (though not all) are poor writers. Ideas put down more or less at random get disjointed and it becomes almost impossible to bring them together later in any kind of systematic manner. Also it seems that most of the random writers have not developed the discipline which it takes to do a good job of structuring or the imagination to tell an interesting story. To my mind a piece of scientific writing, regardless of the audience at which pitched should be a straightforward story with a beginning, a middle and an end.

Most good writers try to visualise a complete structure for a paper before any writing is done at all. Though ideas will be incomplete at this stage, they try and picture the introduction, the chapter or main section headings and what will go under each, and the order in which the material will be presented. Later they write down this outline, and flesh it somewhat by putting in more headings or sub-headings in appropriate places. This then becomes the framework for the first draft which of course is very often altered subsequently as the whole thing takes shape and further ideas are developed during the writing.

Surprisingly many of the books on writing pay little attention to the initial structuring of material. This is a great pity, because most of the faults found in scientific writings are not misspellings, or bad grammar or even bad sentence construction. They are nearly always bad structuring. Ideas which should weld naturally are repeated under different wording, or worse still, dispersed throughout with no coherent story drawing them together.

It should be pointed out however, that young writers find it difficult to visualise an abstract structure in advance and for them certain training procedures have to be developed. One such procedure is to get the writer to make a list (in any kind of order)

of 20 to 30 main ideas which he wishes to have presented. He should then be asked to classify these into common groups each of which will form the substance of a section or chapter. He should then put the chapters in logical order to give an overall structure for the paper.

In organising the structure and writing the report the following points should be noted:

1. State the problem to be studied and say why this problem was chosen.
2. Review the literature on work done in this area.
3. Outline the hypotheses to be tested and explain the methods adopted in doing this, including the sources of data, method of collection, sample size, sampling method used etc.
4. Present the results in some kind of systematic order and
5. Write a short summary of the work in simple language which can be quoted by the newspapers to give a layman's version of the paper. This is a very important part of the whole exercise because we are forced here to tell simply what we have done and what we have found out. The summary should always be less than one tenth the length of the main text.

As might be expected the presentation of results (section 4 above) is the most difficult part of the work as it involves ordering of the material in an attractive form and deciding what should and should not be included. Though inclusions and exclusions are considered in making the original structural outline, these considerations must be of a general nature and when the actual writing commences, plans may have to be revised and further decisions made. For example the writer will have to decide on the best method of displaying material, whether in tables, graphs or diagrams. He may find that a table does not go well in the text and may decide to put in an appendix. He may also have to decide whether to describe something verbally or put it in mathematical form and so on.

The type of wording to be used also requires consideration and will depend a good deal on the audience for which the paper is intended. As a general rule however, simple

words and short sentences should be used, keeping technical terms to a minimum. The use of technical terms is essential in writing for scientific journals but in my opinion they should never be used merely to impress non-scientists.*

Other points worthy of note are:

- (a) Avoid undue repetition. In the spoken language repetition is useful for emphasis. In written language it must be used sparingly.
- (b) As far as possible deal with each idea separately and complete what is to be said about it before going on to the next point. (Where several ideas are interlocked - reference forward and backward is of course necessary).
- (c) Do not introduce a new term in the text as if readers knew about it already and then proceed to explain it in subsequent sentences. If you assume that readers are unfamiliar with a particular term or phrase then it should be explained before it is used, or at least in the course of using it.
- (d) Do not hesitate to rewrite, polish and restructure up to the time when you must meet a publication deadline. The first draft is never more than a rough outline - a rough path through the woods as it were. Even the best writers do third and even fourth drafts before presenting a work for publication. In this connection it is instructive to quote from Schumpeter's description of Keynes's famous biographical essay on Marshall (Economic Journal, September 1924). Schumpeter said "He evidently lavished love and care on it. As a matter of fact it is the most brilliant life of a man of science I have ever read. And yet, the reader who turns to it will not only derive much pleasure and profit but also see what I mean. It starts beautifully, it ends beautifully but in order to be perfect it would have needed another fortnights' work." (2)
- (e) At the writing-up stage research assistants should be put in the picture as much as possible. Mostly they should be asked to make the first draft but in some cases it may prove worthwhile to divide the labour with the assistant responsible for drafting certain sections rather than the whole report. Regardless however of who does the drafting we must not shirk from revising and redrafting where necessary.

* Some people would maintain that unless a certain amount of technical terms are used in a research report it will not be taken seriously either by the public or by administrators. I do not agree with this.

(2) Schumpeter, Joseph A., Ten Great Economists: From Marx to Keynes, Allen and Unwin, London 1952.

Finally I list below a few books on the art of writing which I have found very useful.

1. Writing Technical Reports, by Bruce M. Cooper, Penguin Books, 1967.
2. Style, by F.L. Lucas, Cassell & Co. Ltd., London, 2nd Edition 1974. The last chapter in this book entitled "Methods of Writing" is really excellent.
3. The Complete Plain Words, by Sir Ernest Gower, revised by Sir Bruce Frazer, Pelican Books, 1974.

Summary

What I have said above might be summarised briefly as follows:

1. Do not expect an inexperienced research assistant to do a competent research job on his own. He cannot, and you must stay with him all the time.
2. Always prepare a good research outline before starting a project. This will serve as a framework for your research and for the written report. In the outline say what you propose doing, why you are doing it and how you are going to do it. Many workers also like to outline what they expect to find out, but they usually do not broadcast this widely; they keep it hidden away for future reference.
3. Pay great attention to detail and accuracy during the field work and data processing.
4. Try to imagine what your report will be like, before you write anything down, and visualise it as a story with a beginning, a middle and an end.
5. During the writing do not hesitate to redraft, polish and re-word. It was the great Michael Angelo who said: "trifles make perfection but perfection is no trifle".