The University of Sydney

AUSTRALIAN CENTRE FOR INDUSTRIAL RELATIONS
RESEARCH AND TEACHING (ACIRRT)

RESEARCHING INDUSTRIAL RELATIONS

METHODS AND METHODOLOGY

edited by Diana Kelly

MONOGRAPH No. 6

Researching Industrial Relations: Methods and Methodology

edited by

Diana Kelly

ACIRRT Monograph No. 6

Published December, 1991

by

Australian Centre for Industrial Relations Research and Teaching (ACIRRT)
University of Sydney
New South Wales 2006
Australia

Telephone: (02) 692 3786
Fax: (02) 692 4729

ISBN 0 867 58 557 9

Contents

Notes on the Contributors

Brian Brooks is Professor and Director of Executive Programmes at the Australian Graduate School of Management.

Michelle Brown is Senior Lecturer in the Department of Applied Economics at the Victoria University of Technology, Footscray.

Ron Callus is Associate Professor with the Australian Centre for Industrial Relations Research and Teaching, University of Sydney.

Braham Dabscheck is Senior Lecturer in the Department of Industrial Relations and Organisational Behaviour at the University of New South Wales.

Norm Dufty is Visiting Research Fellow in the Department of Industrial Relations, University of Western Australia.

Bradon Ellem is Lecturer in the Department of Industrial Relations and Organisational Behaviour at the University of New South Wales.

Margaret Gardner is Senior Research Fellow, Key Centre in Strategic Management, Queensland University of Technology.

Diana Kelly is Lecturer in the Department of Economics, University of Wollongong.

David Plowman is Professor and the Head of Department of the Department of Industrial Relations and Organisational Behaviour at the University of New South Wales.

Ross Shanahan is Senior Lecturer in the Department of Labour Studies, University of Adelaide.

Paul Sutcliffe is Senior Lecturer in Management and Industrial Relations, School of Human Resource Management and Labour Relations, Queensland University of Technology.

Nadia Verrucci is Lecturer in the Department of Economics at the University of Wollongong.

Keith Whitfield is Senior Lecturer in the Economics Section of Cardiff Business School, University of Wales.

PREFACE AND ACKNOWLEDGEMENTS

The increased role of Industrial Relations as a policy instrument at both the micro and macro levels has placed new pressures on researchers to produce rigorous and relevant material. Yet source books on the bases and methods of research in Industrial Relations have been notable by their absence. The primary aim of this book is therefore to **begin** to fill this gap by offering a coherent collection of chapters on the fundamentals of social science research, as it pertains to Industrial Relations.

However, it can only **begin** to compensate for this dearth of literature on methods and methodology because very much more needs to be said. And that is the secondary aim for this book—to provoke debate on the assumptions and processes of research in Industrial Relations. It will become apparent that most of the authors would welcome more discussion or more awareness of particular procedures or approaches. In order that Industrial Relations might continue to be rigorous and dynamic, I hope this secondary objective is fulfilled.

Editing a book, many warned me, was a dangerous exercise fraught with chasms of misunderstanding and destroyed friendships—a thankless and time-consuming task, I was told. It has not been thankless. The authors of the chapters were encouraging, prompt and thorough. They were asked to pitch their chapters to the upper undergraduate or graduate level and to meet with requests for aptness and liveliness. I believe they have fulfilled all these requirements with flair and skill.

To all of them—Brian Brooks, Michelle Brown, Ron Callus, Braham Dabscheck, Norm Dufty, Bradon Ellem, Margaret Gardner, David Plowman, Ross Shanahan, Paul Sutcliffe, Nadia Verrucci and Keith Whitfield—I give my sincerest thanks for being an editor's dream, and for providing their time, expertise and experience in their chapters.

Particular thanks must go to Braham Dabscheck who provided crucial assistance and advice in his inimitable and encouraging manner.

Robert Hood gave invaluable research assistance and was essential, for his thoroughness, supportive attitude and patience, in the production of the final camera-ready copy. Chris Nyland, Rob Castle and Tom Keenoy provided much needed moral support and advice.

Sophie Abercrombie, assisted by Julie Chin and Maree Horne, ably dealt with technical layout matters and retyped some of the chapters. Their continuing tolerance, expertise and support, despite continuous imperative demands from

numerous academics, is recognised and gratefully appreciated.

Finally, the book was produced with a grant from the Australian Centre for Industrial Relations Research and Teaching (ACIRRT), without which this book would not have appeared.

Diana Kelly
University of Wollongong
October 1991

1 Introducing Methods and Methodology

Diana Kelly

The need for a source book of methods, offering discussion of some of the procedural and methodological issues in Industrial Relations, has been apparent for some time. Novice practitioners or research students have frequently acquired their research skills intuitively or experientially in an undergraduate degree, skills which need to be enlarged once they enter the workforce or commence more advanced research. Faced with the need to produce a rigorous piece of work for a wider and more critical readership, the novice must move beyond undergraduate research practices. To do so, such analysts need to be aware of their own underpinning philosophies and be able to identify and choose appropriate forms of inquiry. That is the primary aim of this anthology—to assist those with less experience in applied or theoretical research, either within a research methods course or as a source book of methods from some highly experienced researchers.

But there is a secondary aim too. This is related to the future directions of Industrial Relations. Of all disciplines, Industrial Relations has long been the one most characterised by self-doubts regarding its place in the scheme of things on the part of many of its exponents. The need to deal with these doubts has gained greater urgency in recent years, as pluralist approaches in social science inquiry have given way to the quick fix and a search for the single answer. It is timely, therefore, to provoke further debate into methods and methodology in Industrial Relations, in order to develop upon the frequently unrecognised depth and valuable contribution of Industrial Relations to both scholarly thought and applied policies.

WHY A SPECIFIC TEXT FOR INDUSTRIAL RELATIONS?

One reason for the need for further debate into methodology comes from this lack of recognition of the nature and depth of much Industrial Relations research from those outside the discipline, as well as the epistemological anomie that exists within it. Put any two Industrial Relations scholars together and you will have a raging debate about its very definition. This has exacerbated the self-imposed vulnerability of those within the discipline, yet the practice and study of Industrial Relations continues to grow in significance. Further, but more focussed, discussion as to its methods and methodology is therefore needed.

There are three possible areas which deserve highlighting in the context of developing the skills of Industrial Relations research and analysis for the novice researcher. These are also the same areas which justify the value of a specific text for Industrial Relations research. It is not that the wealth of social science (including economics) or management texts on methods will not be helpful, but rather that there are features specific to each discipline which are identifiably of each discipline. In Industrial Relations research, three of these features are: the inexact nature of the employment relationship, the apparent need to 'take sides', and the absence of Grand Theory. Between them, these features contribute to the complexity of Industrial Relations and its claim as a unique discipline. All, *inter alia*, contribute to the uncertainty of many of within the discipline. This is the reason some Industrial Relations researchers seek the safer confines of more fashionable fields of study or more traditional disciplines.

THE COMPLEXITY OF INDUSTRIAL RELATIONS

The control and administration of the employment relationship is the central concern of both the study and the practice of Industrial Relations. The employment relationship is a very inexact relationship, based on expectations of reward and exchange and on issues of equity and efficiency. It is grounded in strongly held, but vague and value-laden, constructs such as fairness, skill, effort, job satisfaction and satisfactory performance, to name only a few. It is a 'complex, subtle and uncertain relationship' (Keenoy, 1985), and to attempt to control, regulate or administer the multifarious facets of the employment relationship is fraught with pitfalls. Yet in these times of increasing economic pressures in an unstable international economy, the control and administration of the employment relationship has taken on greater, more urgent imperatives than ever before. Not only are employees and employers or managers seeking to optimise their shifting frontier of control over the employment relationship at the workplace, but also employer organisations, governments and trade unions are following the needs of their particular constituencies under peculiarly shifting economic and political sands.

The dynamism of industrial relations indicates a further problem with its research and analysis, and so a further reason why books such as this may offer ways of strengthening the discipline. The practitioner and, increasingly so in recent years, the academic analyst is bound up in the issues of the moment. An

examination of the large number of commissioned reports or the growing number of journals attest to the focus on contemporary aspects of the employment relationship. With little time to deepen research capacity, the acquired skills of undergraduate research are only somewhat extended in the urgent arena of producing practical research. Even theoretical research is done under pressure to produce far more and more quickly. This predominance of immediacy, the importance of the issues of here and now, has, of course, been the case with Industrial Relations since the Webbs first proselytised the need for unions. It would be difficult, however, to understate the current volatility of the international economy and the pressures this places on analysts and policymakers at all levels. Exponents of the discipline of Industrial Relations must therefore be able to deal with this volatility without losing rigour.

Further—and here the Webbs come to mind again—Industrial Relations analysis often needs to 'take sides', to produce evidence for a particular frame of reference. With proper comprehension of research methods and methodology, the analyst can avoid the sloganeering endemic, for example, to daily press offerings on Industrial Relations.

This is because what makes Industrial Relations valuable as a discipline is that it is pluralist, not in the early Foxian sense (Fox, 1966). Rather, Industrial Relations is unfettered of either a self-limiting 'grand theory' such as that which binds many economists, or of an essential entanglement with one frame of reference, such as the confining boundaries apparent in much management literature. The study and analysis of Industrial Relations is pluralist in that it can be, and is, undertaken from any political or economic corner. As a discipline, it is not dependent for its success or survival on particular methods or methodology. This is the great and unique strength of Industrial Relations, especially in these volatile times.

At its base, a diluted epistemology does not of itself weaken a discipline, nor lessen its right to be a discipline. Those who argue that 'a general theory' is essential for an area of study to be designated a 'discipline' neglect the fact that no social science discipline has 'a general theory'. What many disciplines have are some general theories to which most of their exponents attach themselves. What is needed to sustain a discipline is rigorous methodology with apt and thoroughly applied methods, and an identifiable concern with matters fundamental to that discipline. Plurality may indeed be an advantage, rather than evidence of weakness, a fact which those pessimistic about Industrial Relations do not always recognise.

But this plurality also makes immense demands on the novice practitioner or researcher, or, indeed, on the more experienced researcher. Without the safe houses of neo-classical economics or strategic management, the plurality of methods and theoretical perspectives available to Industrial Relations analysts can lead either to diffusion and vague wooliness or, worse, to mere description masked as analysis. Richard Hyman, for example, has remarked on the similarity between much Industrial Relations writing and that apparently international primary-school composition in the new term, 'What I did on my

holidays'.[1] Deeper awareness of theoretical underpinnings and methodological frameworks, and a thorough appreciation of research methods, are ways of avoiding such pitfalls. What separates Industrial Relations from other disciplines, then, is its focus on the employment relationship and the institutions which seek to influence or determine that relationship. Theoreticians or policymakers within other disciplines may well apply theories (great or small), or techniques from their own disciplines, to Industrial Relations issues. However, while their findings may be of great interest to Industrial Relations analysts, what they are doing is not in itself Industrial Relations. The latter, while multi-disciplinary, does have specific concerns and particular research methods which are not properly addressed by the application of techniques from other disciplines.

Therefore, this monograph aims, firstly, to assist the beginning researcher to avoid the pitfalls of research, and, secondly, to provoke the more experienced researcher to evaluate her/his approaches to research in a discipline which offers much, but markets itself relatively poorly. To understand and communicate the complexity of industrial relations thus requires considerable proficiency and analytical prowess. In these times of the primacy of economic efficiency and the need for quick fix answers, it behoves the Industrial Relations professional to practise and sell the necessity for thorough research and analysis with skilful use of the plurality of available approaches.

OUTLINE OF THE MONOGRAPH

The structure of this anthology is based on The Perfect Researcher (TPR), who, like Plato's Chief Good, is not a reality but an ontological perfection, an absolute ideal against which we measure our reality. TPR has, of course, only one focus, her/his research. It (the TPR—as an ontological ideal, it has no problems of sex or gender) has no demands of partners, children, aged parents, socially unacceptable flatmates or wine/beer-swilling mates (indeed, the friends of TPR are always ready, indeed anxious, to listen to its newest ideas or insightful analyses, critically but encouragingly), nor competing demands of a job and/or career. Yet, TPR lives in perfect surety of a sufficient income, interested and encouraging mentors who themselves are always readily available, easy access to a well-disposed and perfectly complete library, replete with the best databases, and with full use of perfectly reliable (and available) computers, user-loving software and unfailing printers.

If this description fits you, then the structure of this monograph will be no more than a game plan, about which you already knew. If you fail as a TPR, you will still no doubt recognise in any case that in Industrial Relations research, as in any project, there is a series of ideal steps which everyone agrees to be A Good Thing, but almost nobody follows. That is the structure of this monograph.

---

1 Hyman made this wry observation during the ERU Conference, 'The Future of Employment Relations: International Comparisons in an Age of Uncertainty', held at Cardiff on 17 September, 1991.

An ideal game-plan should, like the Wallabies' efforts in the 1991 World Cup, be seriously attempted, not merely left forgotten in an unsalubrious corner. But just as the Wallabies found that game-plans don't always come to fruition exactly as expected, neither do researchers always find that their plans produce exactly what was wanted. However, trying to stick to such plans, and certainly to the fundamental steps, **does** bring results.

This book begins with Dabscheck's essay on methodology, or the basic questions of inquiry. Plowman's and Gardner's chapters on research and design take up the methodological issues as they present ways of planning a research project. Eight methods follow. Each of these offers advice and insights into a particular process or method of inquiry, as well as commentary on aspects of the method or process. Once the ideal researcher has learned from all these chapters, they're on their own, except for advice gained from wise and helpful supervisors or more experienced professionals. As the ideal researchers begin writing up their projects, they should re-read Brown's and Dufty's chapters, which, as students of rigour and forethought, they will have studied much earlier. This is because there is great merit in beginning to write up findings as early as possible, and subjecting such writing to the critical attention of colleagues—both enemies and friends.

Put another way, subjecting friends and colleagues to the reading of drafts may not always mean that you keep your friends, but it will do wonders for the rigour of your research. And that's what it's all about.

REFERENCES

Keenoy, T. (1985) *Invitation to Industrial Relations*, Basil Blackwell, Oxford.
Fox, A. (1966) *Industrial Sociology and Industrial Relations*, HMSO, London.

FURTHER READING

Anthony, P.D. (1986) *The Foundation of Management*, Tavistock, London.
Barbash, J. and Barbash, K. eds. (1989) *Theories and Concepts in Comparative Industrial Relations*, University of South Carolina Press, Columbia.
Batstone, E., Boraston, I. and Frenkel, S. (1977) *Shop Stewards in Action: The Organization of Workplace Conflict and Accommodation*, Basil Blackwell, Oxford. [see Chapters 1, 11, and Appendices]
Beaumont, P.B. (1990) *Change in Industrial Relations: The Organisation and The Environment*, Routledge, London.
Bell, J. (1987) *Doing Your Research Project: A Guide for First Time Researchers in Education and Social Science*, Open University Press, Milton Keynes.
Benson, J. (1991) *Unions and the Workplace: Shop Steward Leadership and Ideology*, OUP, Melbourne.

British Journal of Sociology, December 1981 [Special issue on Teaching Research Methods].

Bryman, A. (1990) *Research Methods and Organization Studies*, Unwin Hyman, London.

Cohen, L., and Manion, L. (1985) *Research Methods in Education.*, Routledge and Kegan Paul., London.

Giles, A. and Murray, G. 'Industrial Relations Theory and Critical Political Economy: Why There is no State of the Art'. Paper Presented to the Meeting of the IIRA Study Group on Industrial Relations as a Field and Industrial Relations Theory, Brussels, 1989.

Harvey, L. (1990) *Critical Social Research*, Unwin Hyman, London.

Hughes, J. (1980) *The Philosophy of Social Research*, Longman, London.

Hyman, R., 'Theory in Industrial Relations: Towards a Materialist Analysis', in P. Boreham and G. Dow, *Work and Inequality*, Vol 2, Macmillan, 1980, pp.38-69.

Johnson, G.L. (1986) *Research Methodology for Economists: Philosophy and Practice*, Macmillan, New York.

Katouzian, H. (1980) *Ideology and Method in Economics*, Macmillan, London.

Machlup, F. (1978) *Methodology of Economics and Other Social Sciences*, Academic Press, New York.

McCloskey, D. (1987) *The Writing of Economics*, Macmillan, New York.

Mills, C.W. (1973) *The Sociological Imagination*, Penguin, Harmondsworth. [First published 1959.]

Minichiello, V. *et. al.* (1990) *In-depth Interviewing: Researching People*, Longman Cheshire, Melbourne.

Somers, G.G., ed. (1969) *Essays in Industrial Relations Theory*, Iowa State University, Ames.

Taylor, V. 'Politics and the Institutional Apparatus of Australian Industrial Relations in the Late 1980s', in *Journal of Australian Political Economy*, No. 26, 1990, pp.27-46.

2 An Essay on Method and Industrial Relations

Braham Dabscheck

Human beings are distinguished from other species by their ability to think and ponder. They are inquisitive and seek to derive an understanding of the real world which they inhabit. Why did such an event occur? What factors or forces are responsible for particular or various phenomena? Is it possible to predict the course of future events? Scientists claim that they are more able to answer these questions than non-scientists because of their ability to test propositions. Whereas non-scientists base their insights on intuition or feelings, scientists maintain that their analysis and understanding of the world is based on the firm foundation of method and rigour. Method could, in fact, be regarded as a synonym, if not a tautology, for science.

This chapter is concerned with introducing students to various issues associated with method and Industrial Relations scholarship. In particular, it will focus on the choice of research topic, linkages between definitions of Industrial Relations and theoretical approaches, positive and normative statements, deductive and inductive reasoning, scientific method, and key differences between the physical and social sciences.

Science and scientists march behind the banners of method and rigour. Associated with this, there is also a connotation that science is dispassionate and objective; or, at a minimum, is more dispassionate and objective than non-science. It is clear however that, in the choice of research topic, scientists cannot make any claims concerning objectivity. Research choices are made in historical and sociological contexts. Students are invariably counselled by mentors on research topics, as to whether or not the research is 'worth' doing and can be completed in a given length of time, given knowledge concerning data availability and 'the state of the art' of the science or discipline concerned.

Decisions concerning the choice of research topic will result from either one of or a combination of the following four considerations. They are the peculiar interests (biases?) of the researcher; a conviction that previous work is inadequate and can only be improved upon; an imagined or real crisis in the real world which generates interest and calls out for investigation; and the result of direction by a 'superior' force, whether it be at the instigation of an established researcher or due to the policies of private or state agencies which fund research.

Definitions of Industrial Relations can also play a role in the choice of research topic, and hence in the development of theoretical propositions. For example, should Industrial Relations be defined as a process of rule-making where rules govern and regulate the relationships of those involved in industry or work (Dunlop, 1958), or as a process of control? (Hyman, 1975). With the former definition, Industrial Relations is concerned with the maintenance of peace and stability, and has a strong connotation of focusing on effect rather than cause. On the other hand, the latter definition raises the spectre of issues associated with power and domination, and would be concerned with how processes of control are maintained or resisted. The two definitions lend themselves to different research agendas, which, in turn, would produce different and competitive theoretical musings.

There is also the problem of whether a narrow or broad definition of Industrial Relations should be employed. Narrow definitions focus inward, while broad definitions look outwards. It is conceivable that this issue could be resolved in terms of the various questions which are the subject of investigation. For example, in one situation we could be concerned with developing propositions concerning employers/management on the basis of observations and data at particular workplaces; whereas on another occasion, the issue could be the phenomenon in Australia of switching backwards and forwards between centralised and decentralised, or national, industry and firm based systems of interaction. These two different questions would seem to suggest the need for different research agendas which would result in the production of 'different' propositions. However, for this statement to be correct we would need to make the assumption that the two issues are not interrelated—that there is not a connection between employer/managers and the process of switching between centralised and decentralised systems of interaction.

Dufty and Fells have stated 'that the key "industrial relation" is that between the individual employer and the individual worker' and 'that the focus of industrial relations should be at the point of production—the workplace' (Dufty and Fells, 1989, xii). This narrow definition of Industrial Relations, with its focus on 'the individual employer and individual worker' would seem to eschew collective organisations such as trade unions and corporations (and firms which do not have a single employer as such) as a 'key' part of Industrial Relations scholarship. While relationships between an individual employer and an individual worker are undoubtedly important in studying Industrial Relations, it is not clear that the workplace should be the primary focus of research.

Would such an approach, for example, be helpful in trying to understand

industrial relations phenomena associated with women, whether it be in the context of unions, employers/management, the various institutions which constitute the state, and so on? Is it conceivable that the 'key' to the connection between women and Industrial Relations is located away from the workplace and individual relationships between employers and workers; that it is linked to notions of patriarchy and the role that women are 'allocated' in the family?

More generally, the Dufty and Fells definition abstracts industrial relations from politics, or political economy, and considerations of the role of various state institutions which become involved in industrial relations. In addition, other external relationships could be 'keys' in helping to develop an understanding of Industrial Relations. The product market and finance capital could be of more importance to understanding Industrial Relations than the relationship between individual employers and workers. Guille, for example, maintains that 'industrial battles are fought on the bourse floor as well as the foundry floor' (Guille, 1984, 492).

Discussions of method traditionally draw a distinction between positive and normative statements. Positive statements are concerned with *what is*, whereas normative statements are concerned with *what ought to be*. Positive statements, by definition, are concerned with what is happening in the real world, and hence can be tested, or falsified, by reference to facts. Normative statements, on the other hand, simply reflect the desires or value judgements of different groups or individuals. Differences about values, about what ought to happen, cannot be resolved by reference to facts. While differences between protagonists over ought statements often make for heated, spirited, if not interesting exchanges, there is no scientific method available to resolve such disputes; and as a result such statements are eschewed by scientists.

It may appear that positive statements are conservative and concerned with maintenance of the *status quo*, while normative statements are radical and designed to bring about change. A number of comments will be offered here in defence of positive statements. First, it is possible to construct positive statements which are concerned with change, which search to develop an understanding of dynamic phenomena. For example, propositions could be developed concerning what will follow from legislative changes, or the factors which are of importance in increasing or decreasing union membership, and so on. Second, it is much easier to give vent to one's biases and make profound statements about what ought to happen, than it is to develop an understanding of how the real world operates. Third, and most importantly, it is only by attempting to develop an understanding of what is that we can ever hope to initiate action which will enable us to move towards and realise a desired objective. In travelling somewhere, it is helpful to know where we are before embarking on the journey.

The above discussion has drawn a sharp distinction between positive and normative statements. In drawing such a distinction, it should be noted, however, that normative statements are, in a sense, usually based on positive notions, and/or that with a little imagination, they can be manipulated to provide

a basis for positive research. Normative statements, for example, could be made concerning trade unions, whether they should or should not exist. Those on either side of this normative fence could be asked to provide reasons for their respective positions. They would be forced to provide a rationale for their respective positions; forced into providing positive statements about unions (which could be subjected to tests of falsification).

Deductive and inductive reasoning are two methods used by scientists. Deduction is based on the practice of abstract or *a priori* reasoning. This involves the use of thought experiments, rather than reference to facts *per se*, as the basis for developing propositions. With deductive reasoning, various axioms or rules are developed, different situations are imagined to happen, and rules of logic are applied in deriving various propositions. Or to state this in an alternative fashion, on the basis of certain assumptions and in the light of different specified sets of circumstances, such and such phenomena will occur.

It is claimed that propositions based on deductive reasoning can never be wrong. That is, assuming that a proposition has been derived from a given set of axioms, and that the rules of logic have been religiously followed, there is no *theoretical* basis upon which the proposition can be rejected. Notwithstanding the (tautological) veracity of this reasoning, it is nonetheless necessary to subject any and all deductive propositions to close and rigorous scrutiny. At the risk of stating a tautology, a deductive proposition is only accepted because of our inability to find a logical flaw in the said proposition. Deductive propositions may contain and/or be based on unstated or implicit assumptions. By explicitly 'bringing out' these assumptions, and tracing through the implications of their inclusion or exclusion, it is conceivable that different, if not contradictory, propositions will be generated from the 'original' deductive proposition. In addition, subjecting deductive propositions to critical scrutiny, introducing and experimenting with different combinations of axioms, trying to envisage new and different situations, provides a basis for training in and acquiring the ability to develop new deductive propositions.

Scientists often make use of 'ideal types' to help them in their investigations. In principle, 'ideal types' are similar to deductive propositions, though they may also emerge from work which involved inductive reasoning. An 'ideal type' is an abstraction or simplification of reality which seeks to extract the essential features of a particular phenomenon. In developing 'ideal types', scientists are seeking to draw out or focus on the key ingredients or aspects of the issues in question. The usefulness of an 'ideal type' is that it provides a guide, or suggestions, concerning likely causal connections, and, by so doing, helps to define and direct *initial* analysis and research.

Whereas deduction is concerned with thought experiments, induction is based on observation of the real world. Induction involves a scientist in developing propositions from facts or sets of data. With inductive reasoning, propositions are generated, or logical inferences, or predictions, are offered concerning what would occur in other situations or circumstances. For example, an inductionist who had observed unions might develop the proposition that unions with strong

leaders, where power is concentrated at the apex of the union's structure, are more able to win concessions for members than unions with weak leadership, where power is diffused and resides with shop stewards or rank-and-file members. On the basis of this, an inductionist would predict that legislation or other changes which weakened the power of leaders within unions would weaken their ability to obtain concessions for members.

Induction, of course, assumes that scientists are unbiased and impartial, that they assiduously collect, record and report all relevant data, and that they do not exclude examples which do not support or neatly fit into the propositions that they are trying to develop. In the earlier discussion concerning deduction, it was pointed out how important it is to carefully examine, probe and scrutinise such work. It is equally important to subject inductive reasoning to similar probing and scrutiny. Inductive reasoning should be closely examined to ensure that the conclusions which have been drawn do in fact follow from the observations or data upon which they are apparently based. In addition, there may be earlier work (carried out by other inductionists), or other data, which serves to contradict, or, at a minimum, qualify the propositions derived from a particular example of induction.

Scientific method involves the empirical testing of propositions. Scientists not only concern themselves with developing, but also devising means to test, propositions. The first step in this process is to spell out the various components, or axioms and conditions, which constitute a proposition, and to define the various terms which have been employed. The second step is to develop a means by which to empirically test the proposition. Discovering ways and means to test propositions is both very difficult, and the most crucial part, of scientific method. A proposition which is incapable of being subjected to a test of falsification will not be regarded as being scientific.

A major reason why scientists experience problems in falsifying propositions is because of difficulties associated with translating abstract theoretical concepts into constructs which lend themselves to empirical testing. Rex has commented on this difficulty, with respect to the social sciences, in the following terms:

> Too often the value of general theoretical perspectives is underestimated in the social sciences and the criterion of falsifiability is applied with such rigour that no general theory can emerge, the social scientist being left unable to see the wood for the trees. Instead of bad theories being replaced by better ones, theories as such are rejected before they are properly articulated.
>
> (Rex, 1973, 19-20)

For example, it might be reasonable to surmise that notions of power would be useful in helping to develop an understanding of Industrial Relations phenomena. Power, however, is not only a slippery and difficult concept, but is also difficult to apply empirically (Lukes, 1974). Irrespective of this, it would seem to be somewhat inappropriate, if not unwise, to develop propositions

about Industrial Relations which were not based on, or incorporate, notions of power.

Assuming that the various problems associated with translating theoretical concepts into empirical constructs have been resolved, the third step in developing scientifically sustainable propositions is empirical testing. This third step involves a continual dialectic between theory and practice. In trying to derive an understanding of the phenomena in question, it is quite conceivable, if not highly likely, that the initial proposition or propositions suggested or offered for testing (which are sometimes referred to as working hypotheses) will not 'fit' with the facts or evidence gathered. Such an eventuality will either require a refinement or alteration to the initial proposition(s) and/or the inclusion or exclusion of data, which, in turn, will either increase or decrease the scope or applicability of the proposition(s) being developed. Alternatively, a proposition will be useful in some situations, but not others. Or again, there may be some 'loose ends' that won't allow themselves to 'fit' with the proposition that is being tested.

Students tend to despair when they experience problems of this sort. They should not. It is when propositions don't work that science is most interesting and innovative. The development of any scientifically sustainable proposition involves a continual process of moving backwards and forwards between theory and practice, practice and theory; of seeking to discover a bridge, or bridges, which link the two. 'Loose ends' and puzzles are crucial to the process of scientific development. It is in trying to respond to 'loose ends' and puzzles that either refinements to, and/or the development of, new or alternative propositions takes place.

A proposition which fails to survive empirical testing will be rejected by scientists as being unscientific, even though it may experience (an after) life as an 'ideal type'. On the other hand, propositions which survive empirical testing do not result in scientists claiming that the proposition has been proved. Rather, all that will be claimed is that on the basis of such empirical testing there is no reason for rejecting the proposition. Such a double negative, or circumspect, conclusion stems from philosophical problems associated with knowledge and understanding. Scientists adopt a sceptical attitude to all propositions which have satisfied tests of falsification, accepting the need to test and retest the proposition, to subject it to critical and probing scrutiny. It is only by adopting such an approach that scientists can ever hope to allay fears that 'knowledge' is not based on ignorance and superstition.

This chapter has employed the term 'science' generically; that is, it has been implicitly assumed that there are no significant differences involving scientific method between different branches of learning. In particular, it has been assumed that the same approach can be employed in both the physical and social sciences. Scientific method in the social sciences has tended to follow or has sought to emulate the physical sciences, especially physics.

There are, however, at least two important differences between the physical and

social sciences concerning method which should be noted. The physical sciences make use of controlled experiments and replication, which are not or are unable to be employed in the social sciences—the Hawthorne experiment being a famous exception to this rule. Controlled experiments enable physical scientists to isolate and control for variables in developing propositions. Laboratory conditions can be created which enable cause and effect statements to be developed concerning various phenomena. These controlled experiments, in turn, can be replicated by other scientists, which subjects such statements to further tests of falsification. The more times a statement survives tests of falsification, the less insecure scientists feel in there not being evidence available which would result in the rejection of the statement. Every time we switch on a light or drive in a car, we (unwittingly?) participate in controlled experiments which test propositions concerning electricity and mechanics respectively. To the extent that such experiments 'do not work', we do not consider that they constitute a rejection of propositions concerning electricity or mechanics; rather, the problem lies in faulty equipment or our inability to conduct such experiments.

Social scientists, on the other hand, do not enjoy the luxury of controlled experiments. Not only are they unable to develop laboratory situations where they can control variables and discern cause and effect, but they are not even sure that they can identify or have cognisance of the relevant variables which may play a role with respect to a particular phenomenon. In addition, probability theory would tell us that in different real-world situations, different variables may be more or less important, and combine in different ways, with variable weights or degrees of importance. Furthermore, there is hardly any replication of research as occurs in the physical sciences. Social scientists have not developed the habit of re-working a previous piece of research in an attempt to falsify its propositions[1]; rather, they tend to reject propositions by pointing to *new* research in a different context or time period. As a result, social scientists find it very difficult, if not nigh impossible, to develop propositions which have been subjected to the same degree of testing that is associated with the physical sciences.

This chapter has examined various issues associated with the development and testing of theories in the context of studying Industrial Relations. The chapter sought to demonstrate how definitions of Industrial Relations influence research design and the development of theories, and examined the traditional distinction between normative and positive statements, deduction and induction, scientific method and differences between the physical and social sciences. The most important message of the chapter, however, is the necessity of subjecting all propositions and research to critical scrutiny and rigorous testing. Criticism and rigour are the hallmarks of scientific method. Criticism is not something indulged in for its own sake. It serves the function of providing the basis for

---

1 This is not to say the social scientists do not criticise each others work. The point that is being made is that they do not replicate work, to test propositions, as occurs in the physical sciences.

developing new and alternative propositions which will hopefully increase our knowledge and understanding of that which is Industrial Relations.

FURTHER READING

Allen, V.L. (1971) *The Sociology of Industrial Relations*, Longman, London, Chapters 1-3.

Bulmer, M. (1986) *Social Science and Social Policy*, Allen and Unwin, London, Chapters 10, 11 and 13.

Cappelli, P. (1985) 'Theory Construction in IR and Some Implications for Research', *Industrial Relations*, Winter.

Chalmers, A.F. (1982) *What Is This Thing Called Science?* (second edition) University of Queensland Press, St. Lucia.

Connerton, P. (ed.) (1976) *Critical Sociology: Selected Readings*, Penguin, New York.

Dabscheck, B. (1980) 'The Australian System of Industrial Relations: An Analytical Model', *The Journal of Industrial Relations*, June.

Dabscheck, B. (1989) *Australian Industrial Relations in the 1980s*, Oxford University Press, Melbourne, Chapters 1 and 8.

Derber, M. (1967) *Research in Labor Problems in the United States*, Random House, New York.

Dufty, N.F. and Fells, R.E. (1989) *Dynamics of Industrial Relations in Australia*, Prentice Hall, Sydney, Introduction.

Dunlop, J.T. (1958) *Industrial Relations Systems*, Holt, New York.

Guille, H. (1984) 'Industrial Relations Theory: Painting by Numbers', *The Journal of Industrial Relations*, December.

Heneman, H.G. (1969) 'Toward A General Conceptual System of Industrial Relations: How do we get there?', in Somers, G.G. (ed.) *Essays in Industrial Relations Theory*, Iowa State University Press, Ames.

Hyman, R. (1975) *Industrial Relations: A Marxist Introduction*, Macmillan, London.

Kerr, C. (1964) *Labor and Management in Industrial Society*, Anchor, Garden City, pp.3-20.

Laffer, K. (1974) 'Is Industrial Relations An Academic Discipline?', *The Journal of Industrial Relations*, March.

Lukes, S. (1974) *Power: A Radical View*, Macmillan, London.

Marsden, R. (1982) 'Industrial Relations:A Critique of Empiricism', *Sociology*, May.

Myrdal, G. (1970) *Objectivity in Social Research*, Duckworth, London.

Rex, J. (1973) *Key Problems of Sociological Theory*, Routledge and Kegan Paul, London.

Somers, G.G. (1969) 'Bargaining Power and Industrial Relations Theory', in Somers, G.G. (ed.) *Essays In Industrial Relations Theory*, Iowa State University Press, Ames.

Stretton, H. (1969) *The Political Sciences*, Routledge and Kegan Paul, London.

Taylor, V. (1982) 'Australian Industrial Relations Research and the Need for Heretics', Paper, ANZAAS Congress, Macquarie University, 10-14 May.

3 Research Design and Research Strategy

David H. Plowman

INTRODUCTION

The purpose of this chapter is to outline the major components of research design, a critical part of any research. The chapter also suggests strategies which may assist students in maximising research output and, hopefully, in submitting theses and other research on time!

RESEARCH DESIGN

In essence, research design is about the 'What?' the 'Why?' and the 'How?' of research.

The 'What?' is concerned with topic choice.

Sometimes, as in the case of commissioned, policy-oriented or applied research, the choice of topic is a relatively straightforward one. For many students' theses, however, it is a matter of deliberation and even heartache. Supervisors are often confronted with students who want to undertake a thesis but are not sure (or have no idea!) about what topic. In part, this problem arises from an inflated perception about the nature of theses, particularly at the Honours level. Many students expect that the completion of a thesis will make them experts in the area of their work, or that their career choice is contingent upon choosing the right topic. These expectations are not correct. Researching and writing in a particular area should increase the researcher's expertise in that area. Thesis research and writing, however, are such constrained operations that they are more likely to indicate the gaps in one's knowledge than they are to give any assurance of expertise. While the thesis topic is not irrelevant to job choice, it is seldom the dominant factor. Thesis writing should be viewed as a method of

developing research and writing skills of general application, rather than a method of developing specialised expertise. Thus, topic choice is not a matter of life or death.

One way of minimising the problems associated with topic choice, and in particular in ensuring that these do not lead to delays, is to think about potential topics well in advance. It is desirable, for example, for prospective Honours students to have sought advice and determined their thesis topics before the completion of third year.

An important consideration is interest. Even under the best circumstances, writing a thesis requires a great deal of work and determination. Student interest in the thesis topic can often make the difference between perseverance and abandonment.

Selecting the topic is only the first stage. The topic must then be broken down into a manageable and researchable one. Consider, for example, the student who proposed, as his Honours thesis topic, 'Strikes in Australia'. This proposal is, at best, a starting point. Before it can become a manageable thesis, it requires greater specification: Over what period of time? In which location(s)? In which industry or industries? Over which issues? And so on.

Breaking the topic down into a manageable one is important. Equally important is determining, at a very early stage, whether or not the topic is researchable. This necessitates consideration of two factors: the capacity to access needed data, and the capacity to utilise the appropriate research techniques to analyse that data. Thus, if the student wishes to analyse 'Trans-National Corporations and Strikes: The Case of the Aluminium Industry 1970-1985', a critical factor is whether or not official or other sources of data are available. If the official data does not give details of the aluminium industry (however defined), and if companies are not prepared to give access to their strike data, the topic is not researchable.

Again, if the student wishes to compare strike occurrence in two companies employing similar technologies but different human resource management approaches, the student must ensure access to company records before being committed to that topic.

In addition, the student must ensure that he or she has the appropriate skills to analyse the data. For example, research on the strike propensity of non-English speaking migrants may require facility in other languages. If the researcher seeks to test the relationship between trade union power and strike incidence, he/she should be adept in the statistical techniques needed, including knowledge of how to construct a proxy for trade union power. A research proposal based on a participant observation approach (see below) may be inappropriate if the student has also to attend classes.

A useful checklist for topic selection is provided by Anderson, Durston and Poole (1970, pp.16-17) in their book, *Thesis and Assignment Writing*:

1 Is there adequate supervision?
2 Does the topic really interest you?
3 Can the topic be completed in the required time?
4 Is the necessary equipment available?
5 Are the subjects available?
6 Are library facilities sufficient?
7 Is the study feasible?
8 Is the problem a significant one?

THE 'WHY?'

Like other endeavours, research is undertaken for a purpose. For the student, that purpose may be self-evident—fulfilling the requirements of a degree. Other researchers will have differing reasons for undertaking particular work. Irrespective of the reason for undertaking research, the choice of the particular topic is a matter for justification. The research could be undertaken to test a particular theory or to add to the debate on a particular issue. Research is often conducted to provide knowledge in an area of neglect. Policy-oriented research may be dictated by prevailing needs. Other research may be motivated by the need to analyse contemporary developments.

As most research has to be constrained in order to make it manageable, the nature and reasons for those constraints should be identified. Thus, in the proposal instanced previously, 'Trans-national Corporations: The Case of the Aluminium Industry 1970-1985', not only should some explanation be given for undertaking this topic, but so should the reasons for the limitations. Why trans-national (rather than national) corporations? Why the aluminium industry? Why 1970-1985? The researcher should also indicate to the reader how key terms (for example, trans-national corporations) have been used. Even seemingly common terms may need clarification. Thus, if company records are the source of strike data, it is possible that the company has adopted a different statistical definition of strikes to the Bureau of Statistics. If so, the company's approach should be made explicit. The boundaries of industries under review are in need of definition. In the example given above, the researcher should indicate what is considered to constitute the aluminium industry. The definition could include the mining of bauxite, the refining of bauxite to alumina, the smelting of alumina into aluminium logs and ingots, the extrusion and rolling of aluminium logs and ingots, the fabrication of window and door frames, the use of aluminium sheets as wall curtaining, and so on. Alternatively, the industry could be defined in a more limiting way, depending upon the purposes of the research.

THE 'HOW?'

Research is as individual as noses and it would be wrong to propose any blueprint which constrained individualism and creativity. However, just as different noses have a number of elements in common which lead to their

recognition, so too there are common characteristics of research. In essence, most research involves four components:

a the identification of a problem which defines the goal of the research or the question to be examines;
b the gathering of data with a view to resolving the problem;
c the positing of hypotheses;
d the use of the data to empirically test the hypotheses.

The methods and techniques of social science research are heavily influenced by what is called the scientific method. The scientific method is an approach which utilises inductive thinking processes and which attempts to reduce the role of deductive thinking.

Deductive thinking starts from a particular generalised premise and applies this to particular situations. A problem in this approach is that the wrong premise can lead to wrong prescriptions, irrespective of faultless logic. Consider, for example, the possible conclusions which could be drawn by the captain of a ship whose guiding principle is that the earth is flat. Deductive reasoning can give rise to guiding premises which are based upon superstition, mythology, religion, prejudice or ideology, rather than the testing of propositions.

Inductive thinking attempts to establish general laws—premises—on the basis of testable observations. It begins, not with a premise, but rather with observation.

In the physical sciences, this approach has given birth to the experimental method. In the laboratory situation, where rigid controls can be applied to experiments, scientists can conduct an experiment over and over again to establish general laws. Further, because of the capacity to control the environment, they are able to selectively change variables and identify the impact of these changes.

It is this basic approach to the scientific method which many social science researchers have attempted to import and replicate in their own work. This has resulted in a major preoccupation with developing and applying statistical techniques, notwithstanding that two of the important elements of the pure science research are absent—the ability to control the environment and the ability to measure certain variables. Examples will make this clear.

A chemist may be interested in determining the way in which a certain chemical reacts to heat. The laboratory situation enables the chemist to ensure that only those chemicals are present, that their purity is assured, that the quantities are measurable and that the temperature can be controlled. The experiment can be replicated and variables altered.

The application of the scientific method in this instance has greater validity than an experimental design to test, say, the relationship between strikes and temperature. In the latter case, some controls can be applied (for example, for industry), but a large number of intervening variables cannot be controlled—

personalities, company policy, collective will, financial imperatives, and so on. In particular, it is not possible (nor probably desirable!) to replicate the process time and time again.

Testing the relationship between union power and the incidence of strikes is another example. In this case, a major problem is finding a measure for union power. This has been attempted by using proxies (for example, union membership and the rate of growth of unions). This is not a particularly compelling measure and observation suggests that many small unions in critical areas exercise a deal more power than many large unions in areas of relative unimportance. Another difficulty for this exercise is controlling for the two variables of union power and strikes. In the real-world context, a number of other variables intrude—government policy, economic conditions, union leadership, and so on. The usual way of handling these variables (that is, factors which can have changing characteristics or measures) is to assume that they are constant. Thus, the laboratory control conditions are approximated by contrivance.

The application of the scientific method to the social sciences necessitates the use of deductive reasoning processes which were supposedly replaced by inductive reasoning. This is because the social scientist does not have the ability to control the complex and multiple relationships which exist in real life. The controls are usually instituted by a set of simplifying assumptions. For example, in trying to explain the workings of the complex economic system, economists usually start off by assuming perfect competition. This assumption reduces the number of variables which can influence outcomes, and also determines the nature of interaction. Thus, the assumption precludes trade union activities or government intervention. It also ensures that buyers have perfect knowledge and therefore will be able to buy at competitive prices. Economists also use the *ceteris paribus* device to ensure that only the specified variables under consideration are allowed to alter for the purposes of analysis. Under such conditions, economists are able to show the primacy of market forces. This primacy, however, has something of the flat-earth ring to it. It is not the product of scientific method, but rather of assumptions chosen to control scientific enquiry.

The complexities of human interaction, the inability to control the large number of intervening variables and measurement problems mean that the scientific method is, at best, a useful adjunct, rather than the indispensable tool, of social science research. Researchers should not be too mesmerised by its quantitative nature, which seemingly has the capacity to generate exact results. When applied to the social sciences, the scientific method necessitates a degree of deductive thinking and therefore the potential for differing value systems to influence outcomes.

The value of the scientific method for social science research is the major signposts which it establishes for researchers. As the trade union historian Beatrice Webb (1906, p.345) noted, the scientific method consists of three parts, 'observation, conjecture as to cause and effect of the facts observed, and afterwards verification by renewed observation'.

In this schema, research originates with a question based upon observation. This question is articulated as the goal of the research. The principal problem is usually divided into more manageable subproblems. Research into these subproblems is guided by constructs called hypotheses. The hypotheses are linked to general explanations of behaviour called theories. On the basis of data collection and analysis, the hypotheses are either accepted or rejected, as is, by implication, the underlying theory.

This method can be applied to the Honours student's proposal 'Strikes in Australia' in which he sought to explain why strikes occur. In a more formal articulation, this can be constructed as 'The determinants of Strikes in Australia'. To make the project manageable, greater specificity is given—for example, 'The Determinants of Strikes in the Australian Stevedoring Industry, 1960 to 1970'. This manageable project can either form a study in its own right or be a part of a larger study seeking to establish the causes of strikes in Australia. In an even more encyclopaedic enquiry, Australia could be but one component of a major international search for a grand theory.

Even before one starts researching, one has hunches about the answers one might expect to find to the questions under examination. These hunches are hypotheses. Some students find the term disquieting. In fact, there is nothing peculiarly academic about hypotheses. They are nothing more than reasonable guesses as to the cause of a problem. We hypothesise all the time. Consider the common experience of someone placing a key in the ignition of a car and finding that the starter motor will not kick over. A number of reasonable guesses can be made as to why this is the case: the wrong key may have been inserted; the battery may be flat; the battery may not be properly connected; the starter motor may be faulty. Each of these hypotheses is amenable to testing.

In the case of the Stevedoring industry proposed above, several 'reasonable' guesses (hypotheses) may be proposed:

Stevedoring is hard dirty work.
Stevedoring is highly unionised.
Stevedoring unions are communist led.
Stevedoring unions are very powerful.
Stevedoring is a cost-plus industry.
Stevedoring workers are a race apart.
Stevedoring strikes are cost-free to workers.
Stevedoring workers use strikes to substitute leisure for work.
Stevedoring workers are poorly paid leading to wage grievances.
Stevedoring workers are overly paid leading to income/leisure substitution effects.
Stevedoring managers employ poor labour practices.
Stevedoring strikes are the result of historical injustices in the industry.

Other hypotheses can be proposed, highlighting yet again the need to ensure that the study is kept within manageable proportions. For the Honours student or

the academic seeking to write a journal article, one hypothesis could suffice. At the Masters and PhD levels, either more competing and/or complementary hypotheses could be examined or the same hypothesis could be examined more rigorously. For the scholar seeking to write the definite piece on the determinants of strikes in the industry, all of the above could be relevant.

An important part of any research is a review of the relevant literature. This review serves a number of purposes and can also be a rich source of hypotheses. For example, the seemingly obscure hypothesis that stevedoring workers are a race apart comes out of the work of Kerr and Siegel (1954). In trying to explain why the coal-mining and stevedoring industries were strike-prone in many industrial countries, the authors developed what they termed the 'social integration thesis'. This suggested that the strike proneness of these industries is explained by the social isolation of mining and stevedoring communities. This thesis has been shown to have little application in Australia (Deery and Plowman, 1991, p.46).

Similarly, the hypothesis that strike proneness is the product of communist control has been suggested by the work of Bentley (1970). Hines' work suggests the union power hypothesis (Hines, 1964). The income/leisure substitution hypothesis is derived from conventional labour market economics. Historical injustice is the theme of a number of studies.

The list of hypotheses proposed above indicates the degree to which researchers into Industrial Relations problems have relied upon a number of disciplines, in particular economics, history, sociology, anthropology, psychology and law. Naturally, the choice of hypotheses and the vehicles for testing hypotheses will be determined in large measure by the disciplinary background of the researcher.

The advantage of hypotheses is that they turn the problem or question under review into testable propositions. They are tentative answers to research problems. They can be evaluated, rejected or accepted, on the basis of empirical observation. Hypotheses are also important in that they can link the research to the broader framework of theory.

Theories are general explanations of phenomena. Their basic goals are prediction and understanding. These two important attributes of hypotheses are developed in the subsequent paragraphs.

Social scientists have developed a number of techniques for data analysis and, by implication, hypothesis testing. Whatever the survey method used, there is the need to conceptualise the problem, and to determine which concepts or events being studied are constant, and which are variable. As suggested by their name, variables are phenomena which change. Thus, in testing the hypothesis that strikes are more prevalent during heat waves, temperature would be a variable concept. Once variables are identified, the researcher must decide how best to measure them. The methods most commonly used by social scientists are the experimental method, surveys and questionnaires, interviews, observation and description.

Reference has already been made to the experimental method, which is an application of physical-science techniques to social sciences. This is a highly controlled method of determining a direct link between two variables, in the example given above between high temperatures and strike action. A major problem for social scientists is that, unlike the physical sciences, it is difficult to control the research environment. It is not easy to test the link between strikes and heat in a laboratory setting. Thus, experimenting is done by inference—if a condition applies to animals, then it also applies to people. The experimental method may also necessitate a proxy for strikes, for example, anti-social behaviour on the part of the animals as temperatures rise. Under these conditions, controlled experiments can be done on rats to see if changes in temperature are accompanied by anti-social behaviour.

The limitations of this approach are obvious. People may not behave like rats. Anti-social behaviour may not be a good proxy for strike action. It is difficult to duplicate a work environment for rats. The approach is particularly inappropriate in situations where the capacity to measure important attributes is not possible. Consider, for example, the inherent problems in trying to use the experimental method to test the link between communist membership and strike prevalence. In the animal world, not only is it difficult to create the phenomena of strikes, but it is rather difficult to isolate the Marxist rodents! The experimental method is of limited utility in situations where multiple variables are involved—the norm in Industrial Relations research. Despite these limitations, the experimental method has been an important part of research of interest and value to Industrial Relations—for example, in the area of occupational health and safety, such as studies into the effects of smoking and of exposure to chemicals. The experimental method is also and important part of the research design of industrial psychologists.

Surveys and questionnaires are frequently employed in Industrial Relations research. In an ideal situation, the entire population under review would be surveyed. Thus, if investigating the role of shop stewards in facilitating award restructuring in the metal manufacturing industry, a survey of all stewards would be the optimum situation. In practice, time and resource constraints often make it difficult to survey the entire population. There are, however, sampling techniques which enable accurate predictions to be made on the basis of sample surveys.

Interviews are one particular type of survey. Interviews may be unstructured, for example, in a once-off interview with the survivor of a mine collapse. However, where a number of people or companies are interviewed, it is necessary to use a more structured form, usually by way of interview questionnaires. These questionnaires enable the collection of consistent data across a range of interviewees. There are some advantages to this approach over the other method frequently employed, postal questionnaires. There is greater capacity for the interviewer to interact with the respondent, to follow up on leads, and to clarify issues. There is also the potential for a better response rate. There are, however, certain disadvantages with the interview approach. The

time and expense involved reduce the sample size. Further, the interviewer can affect answers, and thus outcomes.

While survey methods are useful in obtaining people's views on particular issues, the observation method (frequently involving participant observation) is better suited to the collection of non-verbal and less easily structured data. As with the other approaches, there are problems associated with this one. They include lack of control over the environment, the lack of quantifiable data, and the necessity to have a small sample size. In addition, the researcher's presence may alter participant behaviour.

One type of observation and description is the case study. This approach is used frequently in Industrial Relations research. The approach enables a somewhat eclectic approach to data collection—historical surveys, interviews, questionnaires, official data, company records, participant observation *etc*—which permits the researcher to draw up a detailed set of relationships. A major problem for this approach is that it is not appropriate to generalise on the basis of such studies.

Case studies are often conducted as research in their own right, often because the case study approach is the most appropriate in some instances (for example, the study of a mining community). In a longer search for general principles (that is, theory) case studies are useful preliminary investigations as they may bring to light the variables, processes and relationships which deserve more extensive attention.

Whatever the survey method employed, the empirical work leads to a set of data upon which the hypothesis or hypotheses under review are tested. In the experimental approach and in survey approaches resulting in numerical data, the hypotheses are 'supported' or 'refuted' (not proved 'right' or 'wrong', since further investigation may suggest a contrary view) through statistical analysis. In other methods, the weight of evidence is used to infer whether or not the hypothesised relationships exist. As noted earlier, one aspect of topic and methodology choice is the researcher's capacity to understand and use the appropriate survey and analysis techniques. In the case of theses students, the supervisor can be expected to play an important role in these matters.

As noted, research can be classified according to its purpose. Action research tends to be policy-oriented. The role of pure or basic research is to provide support or refutation for theory or to establish evidence on which theory can be developed. Not unnaturally, academic institutions have been particularly concerned with the development of pure research, since it contributes to general knowledge.

Hypotheses play an important role in theory building and testing. Research tests hypotheses which, in turn, are explicitly or implicitly linked to a theoretical model. Hypothesis testing thus provides a feedback to the theory or model from which it is derived, either to substantiate the model's continued viability or to suggest modifications. A theory is verified when its generalisations are found to

be accurate in several different settings.

Theorising (seeking general explanations) is thus an integral part of research.

It needs to be appreciated that research may be undertaken either to build theory or to test theory. This is an important consideration in a field of study such as Industrial Relations where there are no generally accepted grand theories. There are a number of researchers whose work is guided by such grand theories, for example, Marxists and neoclassical economists. The approach of these theorists seemingly is closer to the scientific method and the use of inductive reasoning. To them, the work of others who attempt to build up theory is sometimes pilloried as merely 'crass empiricism' of other scholars whose work has been directed at trying to establish theory rather than test particular theories. Such intellectual snobbery is unfounded. It has already been noted that the neoclassical approach, demonstrating the superiority of the market (and thus leading to the advocacy of minimal government intervention), is not the result of inductive thinking but rather the assumptions employed in economic logic. One and a half centuries of testing has not confirmed this view of economic relationships. Similarly, many misgivings attach to the Marxist view of social and labour relations. As noted elsewhere, 'if Marxism is not generally accepted it is not because it is incapable of generating myriads of testable hypotheses, but rather because such testing has been anything but conclusive. In its eschatological dimensions Marxism remains more a matter of faith rather than a matter of scientific investigation' (Plowman, 1989, p.8). In the absence of accepted and testable grand theories, it is not surprising that the search for theory would result in descriptive research. The above exposition suggests two approaches to theory-oriented research. One approach starts off from a theory of social relations which is tested, though seemingly not discarded, on the basis of the results. The other approach looks at the world of social relations and attempts to simplify it through theory. This latter approach has been termed descriptive research.

Descriptive research has its place. It has been held, for example, that Einstein's general theory 'is a gigantic synthesis of a long chain of empirical results' (Dubin, 1969, p.226). In the field of Industrial Relations, a number of influential theories on trade unions were the products of much descriptive research. Commons' theory, relating union-changing organisation to the expansion of the product market evolved from a four-volume history of American unions. Selig Perlman's 'scarcity consciousness' thesis of unionism had similar derivatives. The three-model approach to unionism developed by the Webbs was also the product of descriptive research. As Dubin has noted, descriptive research helps provide the components for theory building: 'Description ... provides the input for developing units of a theory, its laws of interaction, the system states, and the boundaries of the model. Without adequate description, we would not have models that connect with the world we perceive and about which we theorise.' (p.227)

RESEARCH STRATEGY

In common with many other activities, research is enhanced by having a plan or strategy. Critical to this plan is the development of the appropriate research design and the acquiring of the appropriate skills to undertake research. Another important part of the strategy is the development of organising skills and techniques. These assist in optimising research time and output. Space allows only three aspects of organising skills and techniques to be discussed in this paper: the organising of time; the organising of data; and the development of a disciplined approach.

Time management is an important part of researchers being able to meet deadlines. It is very seldom that researchers have an unbridled use of time. For students, there are submission dates. Other researchers are constrained by journal deadlines, promotional dictates, restricted research finances and other factors. It is necessary, therefore, to develop the appropriate use of time.

Two aspects of the use of time may be discussed: maximising unencumbered time and creative time. Though most researchers do have competing activities, there are times when the latter are less pressing. For example, in a normal academic year, students and academic researchers' time is divided between their research and other activities. The latter are less pressing during the 'long vacation', which provides the opportunity for more intense research and for field or travel-related research. The ability to maximise these less constrained periods, however, presupposes that researchers have sorted out their topics, methodology and design. This is particularly so of Honours students. Unless they have determined their research topic prior to undertaking their fourth year of studies, they will have, at best, limited opportunities to utilise long vacations before entering their thesis year.

Within the working week, researchers will find days in which they are free from other activities. Prior planning should ensure that these days are utilised to full effect. Thus, for example, if working from home, the researcher should ensure that references which are needed that day are already to hand. This material could be obtained on other days when the researcher has to attend classes. This obviates the need to travel to libraries and other sources and reduces the time lost in accessing reference material.

Another important consideration is the maximising of what might be called 'creative' time. Research consists of elements—the reading and analysis of primary and secondary materials, the collection, collation and analysis of survey and other materials, the development and testing of hypotheses, the writing up of results. Not all of these functions require the same degree of mental alertness and exertion. The end product of research is a written report. If you write your thesis or report when you are tired (on the day before the submission date) the chances are that it will have a tired feel about it. Writing is a creative art. For this reason, many writers limit their writing period to those parts of the day when they are 'fresh'—typically mornings and evenings. The less creative 'hack' work associated with research and writing—compilations of

bibliographies, analysis of data, checking of references, arranging of interviews and field trips and so on—are reserved for the less 'creative' times of the day. It is possible, with the appropriate organisation of time, to be doing the 'hack' work on one part of the research, while undertaking the 'creative' work on another part, for example, a different chapter. This suggests that the organisation of data is also an important consideration.

It may be trite to note that, in the final analysis, data is organised in a research report which has a beginning, a middle and an end. This should not, however, lead to the assumption that research is carried out in the same order as appears in the final report. Research has a circular or helical character about it. Rather than treating research as a continuum of beginning, middle and end, it may be more useful to treat it as a jigsaw puzzle. In the end, all the pieces must fit together, but that fit, rather than the order in which the pieces were put together, is the critical factor. This does not deny that some ordering is essential. Research would be rudderless if the problem to be investigated had not been properly ordered in the first place. Nevertheless, the research process itself should be more elastic and less constricted. This means that a hiccup in one area (for example, a cancelled interview) would not bring the rest of the research to a halt. As already noted, it also means that researchers can discriminate between creative and other time, rather than having to slavishly follow the ordering of their research plan.

The research strategy should include a time-frame within which various aspects of the work should be complete. This is particularly important for theses students who have deadlines to meet. A realistic timetable should be prepared indicating a time frame for compilation of literature review, empirical surveys, interviewing, chapter-writing and submissions, bibliographical details, final review, binding and submission. Inexperienced researchers tend to underestimate the time needed after completion of the final draft before being able to submit work for assessment. A realistic time plan should include a minimum of two weeks for this stage of thesis preparation.

The appropriate use of data management also suggests that in this age of computerisation students should learn word processing and related skills. The abandonment of what is essentially quill technology should contribute to speedier outcomes.

Few people undertake research for its natural pleasure, and research can be both mentally and physically demanding. It requires a disciplined approach, rather than one in which it is undertaken when the spirit moves. There is much truth in the saying that 'inspiration is ninety-nine percent perspiration'. Discipline is difficult in the absence of a noise-free environment. Discipline should ensure, among other things, that targets are achieved within the determined time frame. Even small targets can lead to realisable outcomes over time. Thus, when British Prime Minister Churchill was asked how he could include writing books in his busy schedule, he noted that all it took to write one book a year was to write one page a day. Discipline is needed to keep work within manageable proportions and to persevere. It requires discipline to stop reading and to put

one's pen to paper (or rather one's fingers to the keyboard!).

May the (research) force be with you!

REFERENCES

Anderson, J., Durston, B. and Poole, M. (1970) *Thesis and Assignment Writing*, Wiley, Sydney.

Bentley, P.R. (1970) 'Communist trade union leadership and strike incidence, with special reference to the Waterside Workers Federation, 1950-1966', *The Journal of Industrial Relations*, Vol. 12, no. 1, pp.88-97.

Deery, S.J. and Plowman, D.H. (1991) *Australian Industrial Relations*, McGraw Hill, Sydney, Third Edition.

Dubin, R. (1969) *Theory Building*, Free Press, New York.

Hines. A.G. (1964) 'Trade unions and inflation in the United Kingdom, 1893-1961', *Review of Economic Studies*, vol. XXXI, pp. 221-52.

Kerr, C. and Siegal, A. (1954) 'The inter-industry propensity to strike—an international comparison' in A. Kornhauser (ed), *Industrial Conflict*, New York.

Plowman, D.H. (1989) 'Industrial relations teaching and research: trends, pressures and strategies' in M. Bray and D. Kelly (eds), *Issues and Trends in Australasian Industrial Relations*, AIRAANZ, Sydney.

Webb, B. (1906) 'Methods of Investigations', *Sociological Papers*, vol. 3, Institute of Sociology, London.

4 'Hopeful But Modest': Research Design for Industrial Relations

Margaret Gardner*

Just as cosmos is a special case of chaos, the imposition of order on recalcitrant material which we optimistically call knowledge is a sometimes thing; hard-won, temporary, and artificial, like the rest of civilisation. (Wildavsky, 1981:128)

We are hopeful because we are modest. (Postan, 1971:34)

Industrial Relations, like all social sciences, is torn between the grand hopes of intellectual inquiry and the despair of meeting demands for relevance, for theoretical coherence and sophistication, and for findings which are both general and certain. The relative newness and insecurity of the field perhaps gives rise to more public displays of gloom when broad questions of theory and method are discussed (Blain and Plowman, 1987; Bray and Taylor, 1986), but hopes are privately cherished and sustain researchers in the field. This chapter is about the first steps in nurturing that flickering faith.

You cannot be a researcher without believing your efforts will better explain the world. Yet reading research does not tell you how to do it. The presentation of findings not only artfully conceals the work required to reach conclusions, but tends to misrepresent the research process as a logical and linear process, rather than a sometimes weaving and stumbling search (Wildavsky, 1981; Bryman, 1988).

---

* Michael Browne, Glyn Davis, and Paul Sutcliffe provided helpful comments on this chapter.

The suggestions for research design that follow outline a series of practical steps. This is not because all steps will be accomplished in the presented order (though this should be the aim), nor that they will be easy and unproblematic. They should be seen as a way of both aiding and checking progress, an anchor for the times when the seas get too high and the project seems about to be swamped by data, or to sink beneath the weight of competing explanations. Industrial Relations is an eclectic subject, and although there may be a tendency to prefer some methods over others, notably case studies, research covers the whole range of social science techniques. So this brief guide to research design attempts to present that diversity, and to suggest no more than that your research questions should direct your choice of approach.

FINDING A PATH

Research begins by transforming inchoate ideas into areas to be studies and questions to be answered. As most methods books caution, this is often a very difficult part of the process—particularly for a new researcher. This stage is really about choosing travelling companions for your research project. They may be 'literary' since the scholarly work of others helps shape and inform the questions we ask; or they may be 'real', including research supervisors and colleagues.

Most researchers cannot remember when and why they became interested in a particular area (Mills, 1974:200; Wildavsky, 1971:8-9). This is because the task of identifying a research topic and question recedes in importance once research is begun. However, for someone approaching the apparently unconstrained choice of a thesis or project topic for the first time, the start is often difficult. The feeling that many things are possible and interesting, but everything seems vague and implausible, may cause mild panic.

Many years ago, C. Wright Mills (1959) made suggestions about 'intellectual craftsmanship' which involve controlling the formulation of ideas. These relied on keeping a file of thoughts and plans for research:

> Under various topics in your file there are ideas, personal notes, excerpts from books, bibliographical items and outlines of projects. It is, I suppose, a matter of arbitrary habit, but I think you will find it well to sort all these items in to a master file of 'projects' with many subdivisions... All this involves the taking of notes ... The first step in translating experience, either of other men's (sic) writing, or of your own life, into the intellectual sphere, is to give it form ... The maintenance of such a file is intellectual production.
>
> (Mills, 1974: 198-199)

These suggestions are primarily for those contemplating a research career, and may seem a grand plan for those beginning a research thesis.

Nonetheless, the process is sound: keeping a file in which your thoughts and interesting articles on various topics are accumulated provides a stimulating base for sketching the questions and paths for your research. If you are at the stage of thinking of a topic for a dissertation or project and the need for a decision looms, you may feel there is no time to 'acquire' a file. Instead, review old essays and reading material—in the course of study much is accumulated, even if it is sometimes not reflected upon.

Once a vague subject area is chosen, a useful second step is to sit down and write out all the questions and themes that occur to you about the topic. Becker (1986:55) recommends this for helping people get started, and I have found it useful for myself and for postgraduate researchers. As Becker notes, when you review what may seem an endless list, you will find a few recurring themes. From these, you can refine your topic and the questions involved.

In all this, that other set of travelling companions, actual or potential supervisors and colleagues, may assist by suggesting topics and recognising the recurring themes in the jumble of ideas you generate.

LOCATING SIGNPOSTS

Once you have identified the themes and questions of interest, previous relevant research needs to be examined in a more systematic manner. The process of undertaking a literature survey is discussed in more detail in Chapter 5, but here I discuss its place in a research strategy.

Reading the literature can become an all-consuming and never-ending task. Many theses founder in their attempt to review the literature. The purpose of literature survey at these early stages of the research project is to identify and refine ideas fundamental to the project, and to suggest hypotheses or empirical lines of inquiry to follow (Stinchcombe, 1982). You must ultimately understand the development of the set of ideas in which your particular project is located, but there is neither need to follow wherever they lead, nor to undertake some antiquarian search for their origins. The literature simply marks out the initial territory of your research.

The literature provides both theories about the topic and evidence about the theories (Mills, 1974:202), or descriptive material about the topic whose relevance to theory is not clear. Apart from research review in which the explicit intention is to point to unresolved or new research questions, researchers often end their papers with a reference to future research needs[1].
Formulating a clear research question or hypothesis means bringing together these secondary materials and your own ideas. Mills (1974:206) suggest four steps for refining questions; these involve outlining:

---

1 See Cooper (1989) for a more detailed discussion of literature reviews and problem formulation.

> (1) the elements and definitions that ... you think you are going to have to take into account; (2) the logical relationships between these definitions and elements...; (3) the elimination of false views due to omissions of needed elements, improper or unclear definitions of terms, or undue emphasis on some part of the range and its logical extensions; (4) statement and restatement of the questions of fact that remain.

The questions you identify from this process might require describing a situation, or classifying the differences between variables, or delineating a relationship (Drew and Hardman, 1985). They may point to understanding how or why particular outcomes or processes occur. In other words, research questions may be exploratory, descriptive, explanatory or predictive.

Formulating such questions is more than locating a series of interesting ideas—even though this is the beginning of the task. As Wildavsky (1981:132) notes: 'the prizes in science go to those who choose what turn out to be interesting and solvable problems'. The questions you choose must be able to be answered. The answers in Industrial Relations are usually found in empirical research—the gathering of data by interview, survey, observation or reading in archives. This means that research questions in Industrial Relations usually must be open to empirical testing. Your research strategy must ensure this is possible.

SETTING A COURSE

Research design means giving some thought to what information is available, or might be gathered, and how it might be gathered. An important, but often overlooked, part of the process is developing operational definitions of your major concepts where this is necessary. If you are interested in union militancy, how do you propose to measure it? Is it enough to equate levels of strike action with militancy? An operational definition of militancy sets out the key attributes and how they might be measured. They may be qualitative or quantitative measures (Smith *et al*, 1976:98-106). For example, though union militancy could be measured by levels of strike activity, this falls short of Allen's (1966) notion that militancy is the willingness to consider and use a range of tactics. To test this idea would require naming a range of tactics and perhaps searching union records to identify when these were considered or used. This could be constructed as a broader qualitative measure.

An operational definition, then, can be a crude proxy for the concepts and questions at issue, or can be a complex exercise in which the original concept gives rise to a series of subsidiary theories and variables. As Easthope (1974:121) notes, 'measurement is a theoretical problem; for the problem of measurement is that of classifying and ordering reality'. Operational definitions make this process explicit. They may '... name, order, and specify intervals' (Jones cited in Smith *et al*, 1985:102). A definition which names also categorises, such as an active or inactive bargainer, democratic or undemocratic

organisation. Ordering specifies the relative rank of a particular measure, such as high, medium and low. Only quantitative measures allow determination of the interval, such as numbers of days lost, or wage and income levels (Smith *et al*, 1985:102-107).

Operational definitions suggest the type of information to be collected. The decision about which research methods to apply is a technical and pragmatic choice about how best to gather that information and answer the questions asked. The decision is technical in the sense that some methods are better suited to certain questions than others; and pragmatic, in that time, access and the availability of other resources will determine to some extent the feasibility of particular forms of investigation. Following chapters on research methods deal in more detail with both the technical and pragmatic aspects of research design. In this section, I will consider some guides to making those choices.

The classic divide in method is between quantitative and qualitative techniques—although there is no reason that research designs should not incorporate both. Often though, pragmatism and the personal predilections of the researcher dictate favouring one side of the divide over another.

The choice is vexed.

> The penalty of being sufficiently concrete to be real is the impossibility of being sufficiently abstract to be exact.
>
> (Postan, 1971:32)

Quantitative methods are typically associated with 'hypothesis-testing' and qualitative with 'insight-supplying' (Bryman, 1988:13). There are a variety of methods, such as surveys and experiments, loosely labelled quantitative and described as concerned to make generalisations (perhaps leading to prediction). These methods typically involve abstraction and measurement of specific hypotheses. These are contrasted with qualitative methods, such as case studies and ethnography, where the focus is on understanding events or cases in some detail. The latter typically require detailed knowledge of a specific field or issue.

The distinction is crude and should not be taken to indicate that discovery or new insights are not available from quantitative methods, nor generalisation from qualitative techniques. Bryman (1988) recounts surprises arising from surveys and Yin (1984) points to ways that case studies may produce findings which may be made general. The division only indicates something about the strengths of particular methods and thus provides a simple decision rule for research design.

Industrial Relations research in Australia is dominated by qualitative techniques, and, in particular, case studies (see Blain and Plowman, 1987). In contrast, in the United States quantitative methods, such as quasi-experimental economic studies and experimental behavioural research, are now common in the field.

It is important to understand the possibilities of various research methods in

order to make an informed choice about research design. Not all methods are discussed in more detail in the following chapters, although most of the basic techniques of quantitative and qualitative research are addressed. Before briefly discussing the methods, some criteria for evaluating their relative strengths and weaknesses are outlined.

Carroll and Johnson (1990:13) describe six criteria which I have modified slightly to guide choice of research method.

1. Discovery—ways of uncovering new phenomena or providing new insights.
2. Understanding—leading to analysis of cause and effect and of the processes and structures creating particular circumstances.
3. Prediction—developing rules to predict outcomes.
4. Confound Control—providing controlled situations to rule out other explanations of events.

These first four relate to the processes of exploration, description, explanation and prediction, and concern largely technical choices about research method.

5. Ease of Use—taking less time and resources for progress towards goals.
6. Ease of Access—degree of dependence on gaining access to relevant data.

The last two relate essentially to pragmatic concerns about research design. The last mentioned substitutes for the prescriptive control criterion of Carroll and Johnson, as I judge that access to data is of particular concern to Industrial Relations research given the ideologically charged atmosphere of the field.

Beynon (1988), for example, provides an interesting account of the variety of these access problems. Gaining agreement from both company and union was the key to access to Ford, and he argues critical to maintaining that access when industrial action erupted. However, he notes that being 'in between' the company and the union raised problems as each tried to gain information about the other from him (Beynon, 1988:27-28). Access may be a logistical problem to be overcome, but it is intertwined also with ethical matters. The confidentiality of material gathered and the extent to which research subjects should be informed of the aims of the research and the findings, are all part of research design.

Case studies[2] are empirical investigations of

> a contemporary phenomenon within its real-life context: when the boundaries between phenomenon and context are not

2 Yin (1984) provides a detailed and cogent discussion of the research possibilities of case studies. The discussion in the text relies on this book.

> clearly evident: and in which multiple sources of evidence are used.
>
> (Yin, 1984:23)

While acknowledging the importance of case studies in exploratory research, Yin (1984) also emphasises their value in explaining how and why events or actions took place. Indeed, because untangling the processes and causes involved in complex social situations makes prior isolation of key variables difficult, the detailed picture built by case studies is invaluable for explanation. Unlike most historical studies[3] (with which case studies overlap), the case study can deal with contemporary events through interviews and participant observation. It involves research situations where the researcher has minimal control over the events or actions in question.

The weaknesses of case study research are twofold. There are limited inbuilt controls for bias or selective interpretation of evidence collected. And it is difficult to reach general conclusions on the basis of a small and limited set of cases. There are, however, a variety of possible case study designs, ranging from single cases with a single unit of analysis to multiple cases with multiple units of analysis (Yin, 1984:41-53). Single cases looking at a union, an organisation, or an event, such as a strike, may be used to represent a 'critical' case to test a theory; as an extreme or unique case to bring new insights; or as a 'revelatory' case which makes inaccessible information on a problem or question accessible. A case study of a union may have only one unit of analysis, such as the leadership, or have multiple units, such as members, shop committees, branch executives, and full-time officials (Yin, 1984:42-47).

Multiple cases may be used in an attempt to replicate results from other studies. If so, they must be chosen carefully either to ensure that the cases provide similar results or that the differences in results can be explained by reference to theory (Yin, 1984:48-49).

No matter which case study design is chosen a standard set of features apply. Each case must be understood in detail in relation to its context and the validity of the findings must be secured through using multiple sources of evidence to test and probe each question, as well as considering and eliminating rival explanations of the evidence gathered (Carroll and Johnson, 1990:39).

Ethnographic and participant observation studies can be seen as a specific subset of case studies—typically single case studies. In a number of famous cases in Industrial Relations, such as Donald Roy's (1952; 1955) studies of work

---

3 I have chosen not to discuss historical method in this chapter. Many of the techniques are covered in other chapters, such as Chapter 6. In design terms, historical studies raise many of the same questions as those discussed under case study or experimental methods (times series work in economic history). One of the important selection questions is determining the beginning and end of an historical 'case'. There must be clear historiographical or empirical reasons for setting the time frame.

practices in a machine shop, the researcher secures access by remaining anonymous and appearing as just another worker.

Research methods relying on observation of the activities of others suffer from the problems attributed to case study work, that is, the findings are specific to the situation observed and it is difficult for another researcher to check those findings independently. Consequently, considerable attention must be paid to the documentation of observations and their analysis. For example, content analysis of conversations or documents is a way of systematically analysing observational and ethnographic data. Briefly, it involves developing codes or categories to which particular statements or actions are ascribed—the final picture is then analysed and interpreted. Like all research, ensuring the validity and reliability of the findings is important and requires close attention to the way categories are defined and data assigned to them (Smith *et al.*, 1976:204-224).

The potential weaknesses of these methods in terms of controls, prediction or generalisation must be considered together with the relatively time-consuming nature of such research and the difficulties of securing and retaining the access necessary. However, there are compensatory strengths in terms of the richness of the information gathered, since the participants are typically unable to heavily censor or filter that information. In other words, the meanings are less likely to be distorted and 'in overhearing you find the answers to questions you might never have thought to ask' (Easthope, 1974:98).

Surveys gather information or social 'facts' about a particular set of propositions or questions. They differ from collection of facts by case method because they attempt to chart completely a particular territory, that is, uncover the incidence or prevalence of certain factors and the relationships between them. These factors tend to be divorced from the specific contexts in which they occur. The way this data is gathered relies on a structured set of questions which may be administered by personal interview, by telephone or mail questionnaire. There is an extensive literature on the procedures for gathering information, from appropriate sampling techniques through questionnaire construction to administration and data analysis[4]. Many of these matters will be addressed in Chapter 9.

The Australian Workplace Industrial Relations Survey (Callus *et al*, 1991) is an example of an extensive survey attempting to capture the dimensions of Industrial Relations in the workplace. It demonstrates the strengths of a well-executed survey, in terms of the confidence with which generalisations can be made about the incidence and prevalence of particular situations and activities, such as industrial action, award coverage, use of grievance procedures, and the like. Surveys are usually deficient in capturing the effect of context on activity or uncovering the workings of the processes they describe, although by uncovering patterns they may point to areas needing more detailed exploration.

---

4 There is an extensive literature on the survey method, some examples include De Vaus (1990), Smith *et al* (1976), Garson (1971).

Experiments are relatively rare in Industrial Relations research, although they have been used to study bargaining behaviour. Experiments are situations in the laboratory or field in which the researcher manipulates the independent variable and measures the change which results (Drew and Hardman, 1985). For example, Farber *et al* (1990) wanted to test the effects of risk aversion and arbitration costs on bargaining outcomes and did so through a set of laboratory studies. The experiments conducted involved a number of independent variables. One, for example, was the direct cost of arbitration. This was manipulated by presenting subjects in the experiment with different scenarios affecting the cost. The outcomes are measured in terms of the wages negotiated in different cost situations.

By abstracting and isolating factors, such as risk aversion, the complexities of context are controlled, as are the possible competing explanations for a series of outcomes. This provides a strong foundation for prediction and generalisation, although the artificiality of the situation casts doubt on its applicability to real events.

An early example of experimental research is the Hawthorne studies[5]. These studies revealed another of the potential difficulties of experiments—that merely by controlling variables in an experiment the situation is changed. By manipulating the rest breaks and the physical working conditions of the women in the study, output was affected, irrespective of the nature and type of the changes made. This has been dubbed the Hawthorne effect (Easthope, 1974).

Quasi-experimental and times series studies are common in labour economics. These involve the manipulation of statistical information, or testing based on groups with pre-existing differences, where one group forms the control and the other the experimental group.

CHECKING THE COURSE

This quick survey of some of the main research methods does not discuss ways of ensuring the validity or reliability of results[6]. Once a method is chosen, internal and external validity and reliability should be considered. Simply, factors other than the one being investigated should be adequately explained and controlled for; and the extent to which the study is representative and generalisable estimated. The potential reliability of the study depends on whether it can be repeated or at least on the fact that conclusions were not solely dependent on the judgement and interpretation of the researcher.

The crucial factor when deciding how you will collect the information necessary

5 A good description and critique of the Hawthorne studies is to be found in Rose (1988).

6 The tests for ensuring the validity and reliability of results from quantitative studies are better developed than those for qualitative studies. Nevertheless, these matters should be considered in all designs.

for your research is being clear about the nature of the questions you are asking. If the questions are broad, the underlying dimensions of the problem unclear, and theory underdeveloped, then the study is likely to be exploratory. Case studies, histories, ethnographic studies are appropriate in this situation. Surveys are also desirable if your interest is in outlining the dimensions or prevalence of a particular issue or problem.

If, however, there is a body of research and theory in the area, then your questions should be more tightly focussed and defined. If your interest is in the outcomes of a particular process, then surveys or time series work is appropriate. If you are interested in the processes which produced the outcomes, then case studies, or perhaps experiments, are the better choice. Case studies are best if your interest is in uncovering the processes; experiments if you have clear and testable hypotheses about the significant factors in those processes.

Consider equal employment opportunity programmes. What have been their effect? Surveys of employees about their experience of discrimination and the effect of equal employment opportunity programmes would provide an answer. Similarly, work on measures of employment segregation prior to and preceding introduction of such programmes might provide another view. However, if your question is, how has EEO been implemented in organisations, a set of case studies is appropriate. You might want to focus on one aspect such as selection processes. Experiments testing reactions to certain situations might be a way of understanding discrimination, and predicting ways of circumventing or alleviating it.

As important a consideration in research design is the time and resources available, and access to data. These may cause modification of the question, as well as affect the choice of method. Experiments are often used where researchers have access to large groups of willing or unwilling students. Surveys require varying amounts of time, depending on whether they are personal or mail interviews, and money. Access to the population to be studied is vital. Archival work may require travel, is often time-consuming, is sometimes subject to access restrictions, but is usually stable and available at times convenient to the researcher. Case studies depend critically on access and cooperation.

RETRACING YOUR STEPS

The criteria outlined and the steps to be taken in designing a research project must be carefully planned, but all researchers must be flexible. They should be prepared to retrace their steps in the face of the many obstacles to producing research.

Mistakes are often made. Projects are often too ambitious, or become overwhelming when the researcher enters the field (Bryman, 1988:9). Information is sometimes patchy; often the original question becomes irrelevant.

As an Honours student, I had to recast my thesis on over-awards in some metal trades plants when the information provided by the firm proved to be inadequate for the questions I proposed to examine. Although I had cooperation from both management and union, I felt the quality of the information was less than might have been possible with a more experienced interviewer whose gender and age was not so conspicuously at variance with the surroundings. In case study research and particularly ethnographic studies, the quality of information is dependent on trust and sometimes on being able to blend into the background.

Descriptions of what happened during the course of a research project rarely match the neat logic of research design outlined in texts. Broadly, this logic is the linear process suggested in this chapter: identify a topic; undertake a literature survey; formulate a research question; develop operational definitions of the concepts to be investigated; choose a research method, or a combination of methods to collect and test the information necessary to answering the question; and ensure that the design and methods chosen will provide reasonably valid and reliable findings. These steps are a guide to how to fit the research process together, ways of avoiding some pitfalls, checkpoints to which you can return if you lose your way. Research design and the methods it incorporates are ways of understanding. It is of greatest importance that we have an idea of what questions must be answered; how we will do so is the subsidiary part of the task.

Industrial Relations has no distinctive method. Despite the possibilities of ideological conflict over interpretations, this has not spilled into conflict over methodological approaches. Pluralism in method and pragmatism pushes epistemological debates aside[7]. Research endeavours have often been modest explorations. That Industrial Relations is yet to build 'grand' theory, to stand above the everyday uncertainties and ambiguities, should not be defined as lack of progress. Inquiry is not bound by what went before, nor limited by absence of an overarching framework. If we ask questions whose answers seem within reach, there is yet hope.

REFERENCES

Allen, V. (1966) *Militant Trade Unionism,* Merlin, London.

Becker, H. (1986) *Writing for Social Scientists,* University of Chicago Press, Chicago.

Beynon, H. (1988) 'Regulating research: politics and decision making in industrial organisations', in Bryman, A (ed), *Doing Research in Organisations,* Routledge, London. pp.21-33.

---

7 This assertion is a judgement of the nature of industrial relations research in Australia, but is also based on the observation of other "inside" accounts of research, such as Bryman (1988) and Wildavsky (1971). In Chapter 11, Paul Sutcliffe suggests that epistemological choices underpin the research process. This chapter, in contrast, is based on the premise that epistemological debates are weakly reflected in the way research is done.

Blain, N. and Plowman, D. (1987) 'The Australian Industrial Relations Literature 1970-1986', in Hince, K. and Williams, A. (eds) *Contemporary Industrial Relations in Australia and New Zealand: Literature Surveys*, Proceedings of the Biennial AIRAANZ Conference, pp.17-56.

Bray, M. and Taylor, V. (eds) (1986) *Managing Labour? Essays in the Political Economy of Australian Industrial Relations*, McGraw-Hill, Sydney.

Bryman, A. (1988) 'Introduction: 'inside' accounts and social research in organisations', in Bryman, A. (ed) *Doing Research in Organisations*, Routledge, London.

Callus, R., Morehead, A., Cully, M., Buchanan, J. (1991) *Industrial Relations at Work*, AGPS, Canberra.

Carroll, J.S. and Johnson, E.J. (1990) *Decision Research: A Field Guide*, Sage, Newbury Park.

Cooper, H.M. (1989) *Integrating Research: A guide for literature review*, Second Edition, Sage, Newbury Park.

De Vaus, D.A. (1990) *Surveys in Social Research*, Second Edition, Allen & Unwin, Sydney.

Drew, C. and Hardman, M. (1985) *Designing and Conducting Behavioural Research*, Pergamon Press, New York.

Easthope, G. (1974) *A History of Social Research Methods*, Longman, London.

Farber, H.S., Neale, M.A., Bazerman, M. (1990) 'The Role of Arbitration Costs and Risk Aversion in Dispute Outcomes', *Industrial Relations*, 29,3, pp.361-384.

Garson, G.D. (1971) *Handbook of Political Science Methods*, Holbrook Press, Boston.

Mills, C. Wright (1974) *The Sociological Imagination*, Oxford University Press, New York.

Postan, M.M. (1971) *Fact and Relevance Essays on Historical Method*, Cambridge University Press, Cambridge.

Roy, D. (1952) 'Quota Restriction and Goldbricking in a Machine Shop', in *American Journal of Sociology*, 57, pp.427-442.

Roy, D. (1955) 'Efficiency and 'the fix': informal intergroup relations in a piecework machine shop', in *American Journal of Sociology*, 60, pp.255-266.

Rose, M. (1988) *Industrial Behaviour*, Second Edition, Penguin, London.

Smith, B.L., Johnson, K.F., Paulsen, D.W. and Shocket, F. (1976) *Political Research Methods Foundations and Techniques*, Houghton Mifflin, Boston.

Stinchcombe, A. (1982) 'Should Sociologists Forget their Fathers and Mothers?', in *The American Sociologist*, 17, pp.2-11.

Wildavsky, A. (1971) *The Revolt Against the Masses and other essays on politics and public policy*, Basic Books, New York.

Wildavsky, A. (1981) 'Rationality in Writing: Linear and Curvilinear', in *Journal of Public Policy*, 1, 1, pp.125-140.

Yin, R.K. (1984) *Case Study Research: Design and Methods*, Sage, Beverly Hills.

5 The Literature Search and Review

Bradon Ellem

INTRODUCTION

At a fairly early stage of a research project, a 'literature search and review' has to be contemplated and written. This usually ends up as all or part of the opening chapter of a thesis and, written well, it can form a vital link between theories and questions on one side and the research findings on the other. This is most obviously the case in locating your own material in the context of work already done. This step—which researchers ignore at their peril—is essential in itself. It is also important in clarifying the direction of a particular research project—part of the almost mutual process of interrogation between sources and author. It will provide other returns: most importantly, in clarifying the central concerns of the thesis or project. Sometimes, it is only the actual process of writing that makes fully clear the ideas, questions and propositions involved in a study.

To some extent, most researchers will be working in areas with which they are familiar. (The best case I know of involves a former fellow student, who wrote his honours, masters and doctoral theses on different aspects of the one issue. He became a professor—very quickly.) Most researchers will know about the 'big names', the major texts and perhaps the trail-blazing journal articles. However, much more than this will be needed. So, how do we proceed?

Two things need to be taken on board before we begin the journey. The very first thing to emphasise is the importance of being organised. This may not sound very important and it certainly will not sound like the things that attract people to research, such as the subtleties of theory or the fine points of empirical detail. Organisation, though, is fundamental—from day one of reading secondary works through to the writing of a difficult paragraph. Other things are important too. Being smart, maintaining motivation and being widely read are helpful characteristics in a researcher—but without organisation, they will

count for nothing. The literature search and review, where many people will begin anyway, is as good an example of this as is anything else.

How do you move from topic and theory, ideas and questions, to defining topics for research? A second vital ingredient (another overlooked one)—some imagination—has to be added to organising ability. Even if we take the worst case possible, which would be working in a new field, there are some procedures which will be familiar. The thesis or project topic should be looked at as an essay or a work task. Ask some simple things to begin: what do I need to know to be able to do this? What other questions need to be answered?

STARTING

These sort of simple but important questions need to be asked so as to limit the scope of the inquiry. The project needs to be both specific and intellectually rigorous. As to limits: at what level of generality will the work be conducted? Conversely, how precise, how focussed will it be? These questions, it must be confessed, do not sound like profound stuff, but they are important—for two reasons. Firstly, the aims and nature of a study need to be clear. This applies as much to a review of the sources as to anything else. Such clarity will help sort out what needs to be read and what does not. Secondly, asking questions about the scope of the study helps researchers to sort out in their own minds not only where their work is headed but why. This is an 'under-asked' question. Some things which need to be thought about will explain this point further: is the study confined to Australia? Is it confined to one state or, say, the eastern states? Which years are to be covered? Is it specific by gender or by type or place of work? And so on. Again, there are two points to be made. Asking these questions is helpful, indeed essential, in itself in order to direct the reading for the review, but it is also fundamentally important in thinking about why other writers have pursued their work as they have. To conclude, then, the preparation and production of a literature review, even down to the question of how widely or narrowly to read is a serious task involving questions of theory, assumptions and method. The index card or the on-line entry is never purely 'practical', 'technical' or empirical.

Let's see how organisation and imagination might be brought into play in the early stages. A sensible and direct way to begin is to locate and read (or re-read) recent published work in the field, examining the ways in which the authors construct their cases and relate argument and evidence to each other. This will have to be done all through the review anyway. At first, though, it is no less important to use the recent material to find more readings. Follow up the writings used—or abused—by recent scholars; trace through the references and footnotes which will aid a particular line of inquiry.

It is vital at this early stage to do two apparently contradictory things. It's necessary both to broaden and limit the scope of a project in general and the preparation of the literature review in particular. Defining limits is a harder task than it seems and, at times, an intellectually frustrating one. (This is an area

where 'industrial relationsists' have got themselves into trouble with each other and with those on the fringe of our concerns. It has almost become a commonplace to bemoan the fact that Industrial Relations is studied in a vacuum, without sufficient recourse to the social structures of which it is part. Notwithstanding the efforts of exceptions like Richard Hyman (1975, 1989), the path-finding work in Australia edited by Bray and Taylor (1986) and the re-discovery of the labour process, this remains true).

What has this parenthetical comment to do with the topic? How does it advance the cause of preparing and writing a literature review? I want to emphasise the importance of something which, in a way, thesis supervisors dread; that is, the broadening of the topic area. It is necessary, both in the review and in the project overall, to push out the boundaries a bit, to test the resistance of the discipline to that pushing. An example: if some researchers were examining issues of pay equity as between men and women in Australia, they might well hypothesise that the arbitration tribunals were important (no prizes so far). Our intrepid scholars might well then ask what patterns of wage-fixing existed before the advent of arbitration. How and why, that is, did ideas about wages for men and women develop as they did? We might even see them tangle with that contra-historical question, 'what would have happened without arbitration?' Did the tribunals, then, simply follow existing practice? Incidentally, our team will quickly discover that these questions *are* being raised, but that they will have to look in the journals coming from women's studies, history and sociology as well as Industrial Relations to find them. The substantive point is this: properly to answer this question, it may well be necessary to go beyond the envisaged scope of the study. In one sense, this is both easier and more important in Industrial Relations than in other areas, because of its multi-disciplinary nature. Here then is the fundamental importance of imagination—to look for 'new' references and for links with apparently divergent trajectories of inquiry.

The other side is the limit to such discovery. To draw from a source almost as old as the study of Industrial Relations, the words of the Rolling Stones are appropriate here: 'It's just my 'magination/Runnin' away with me'. How *do* we keep that 'magination' under control? I referred to this earlier as a source of intellectual frustration. The problem usually turns on questions of time and word-space, although it will arise whether the work in question is a first-year essay, a brief report or a doctoral thesis. Following through on the previous example, it might well be imperative to examine the origins of the nuclear family, the nature of paid and unpaid work in the transition from feudalism to capitalism and to look at the contemporary experience of countries with different systems of wage-fixing, different family structures and welfare systems. However, in most projects it would *only* be possible to mention them in the literature review and use the rest of the study to concentrate on some particular aspects, set in that context, and to suggest some ways forward for future inquiries.

SEARCHING

Having said all this, how might we go about our daily business as this part of the thesis or report is constructed? Using the tentative answers to the 'limiting questions' as a guide, the researcher would have something of a starting point. There would be the beginning of a system of cross-referencing and an idea about where to begin reading. Few people would approach the task with no experience of the area and even if they were shooting in the dark, there would be the standard texts and stand-out articles. These provide a simple way to find more information. A judicious use of bibliographies, references and footnotes can be a very effective second step. If more scientific methods fail, there is always recourse to rifling the index for each of the more obvious journals—*Journal of Industrial Relations, Labour and Industry, Labour History* and others. It is a little time-consuming but not too onerous. There are guides to publications, such as D.H. Plowman and A.J. Walker, *Industrial Relations Teaching, Theory and Research: An Annotated Bibliography* (1985).

However, the time will quickly come when some more complex steps will need to be taken. A proper search, usually based on some initial questions and preliminary reading, should occur early on. This will be the first test of the efficacy of the researcher's narrowing and clarifying of the terms. Researchers should familiarise themselves with *Library of Congress* classifications. They can also find help from D.H. Plowman and A.J. Walker, *Australian Industrial Relations Thesaurus* (1989), 3rd edition.

For much research in Industrial Relations, up-to-date sources and materials from unions, employers, voluntary agencies and governments are needed. Locating these, along with newspaper and magazine articles, as well as the more 'academically recognised' journals, can be a difficult task. These may not be the centrepiece of a literature review, but sometimes they will be necessary. Libraries provide some useful aids in this process. Researchers will find Australian Public Affairs Information Service (APAIS) useful. It is a subject index drawn from newspapers and periodicals, books and conference proceedings.

The newest library innovation is the *CD-ROM search*, which, with only a few lessons, provides a staggeringly efficient way into references—especially for those used to leaning over card-catalogues, peering into fiche and trying to second-guess the mind of the keywords inventor. Among the items available on this are abstracts, APAIS, PAIS (USA), *Social Sciences Citation Index* and *Sociological Abstracts*. Perhaps the CD-ROM's most useful feature for early stages of research is the ease with which keywords can be added or substituted and the search easily limited by other means too.

Many libraries will also hold ILO guides to publications, guides to information from the Commonwealth Parliamentary library, and a range of abstracts from sociology, history and women's studies which may be helpful to the Industrial Relations researcher. Ask and ye shall receive. The researcher's job is to work between sources, bibliographies and ideas. The skills of organised and

imaginative searching should be honed up—but without ignoring every possible resource to make life easier. Another recent innovation, combining resources from universities and governments, is 'Work-Lit', a bibliographical database on Industrial Relations. Most major universities will be able to access, as they say, this information. (But be ready to pay. Welcome to the 1990s.)

For Industrial Relations, it is also well worthwhile following up the publications of the many departments which operate in the field. Students should avail themselves of any contacts they have or can make in order to smooth the path of the literature search. For example, many unions and employer associations now have their own research staff.

There are other ways into the world of Industrial Relations. Some journals keep regular accounts of research in progress. Researchers should also be aware of the reports of conferences which usually contain up-to-the-minute accounts of research in progress. The Association of Industrial Relations Academics of Australia and New Zealand (AIRAANZ) is the most obvious such forum.

This, then, is a broad idea of the basics of a literature search. The initial points should be reiterated, that both imagination and organisation are imperative. Both these traits are similarly important in recording the information uncovered.

From day one, it is vital that proper records are kept. This, again, applies to any part of a project. Once more, it ought to be said that this is about more than simple 'technique'; maintaining records, whether the researcher knows it or likes it or not, both reflects and makes the work. For example, in recording data from primary sources, the keeping of notes arranged, as in the original, on a chronological basis would suggest that the end product itself would be a straightforward narrative, rather than a piece 'making connections', that is, *analysing* the processes under review. Similarly, in preparing a review, researchers should ask themselves at all times what the purpose of their work is. Is a particular text being read because it comes at a certain place in the chronology of publication, or for some thematic reason—or because, like streaking, it seemed like a good idea at the time? The purpose of particular activities should always be clear—and good records will both flow from and facilitate that.

WRITING

To begin the final section of this chapter, there are two 'don'ts' and a couple of counter-suggestions. Firstly, don't assemble all the material and then try to write it. Remember, this is a dialectical process. Thinking, reading and writing should all take place at once. Secondly, don't assume the literature review will be the first part of the whole work to be completed. Remember, it must be explicitly related to the whole body of past work as well as to what follows in the thesis proper.

It should be re-emphasised that it is helpful to begin to write *before* it seems

possible to do so. Subsequent reading needs can then be clarified and modified. That is, there is no sharp break between the search and the review; each should inform the other. This chapter reflects this in that ideas about setting out the review and the sort of questions with which it might deal have been implied in discussing the search. Here, then, only some final comments are needed.

The key task is to place a particular piece of research in a wider field. In Industrial Relations, at least as much as elsewhere, this will inevitably land the researcher in the midst of debates of varying ferocity, given the conflictual nature of the field. This is no bad thing. On the contrary, it compels attention to the fundamental nature of a thesis. A thesis, after all, is or should be, an argument; a proposition, asserted and demonstrated. The literature review should not be (as, regrettably, many are) merely a summary. It should be the beginning of the argument, clearly and inextricably linked with the body of the study.

A good review will do four things: firstly, it will describe the main concerns explored in a particular area and the various schools of thought; and the traditions in, and challenges to, them. Secondly, it will explain the approaches taken. For example, what roles do political-economic contexts play in the construction of certain modes of thought? Thirdly, the nature and success of the methodologies employed will be examined. The review should evaluate the utility of these approaches. Fourthly, the thesis or project will be situated within these traditions and debates. In so doing, it is possible to begin to link theory and data: for example, in explaining precisely the parameters of the subsequent pages.

Two essential things emerge from this: firstly, in the process of preparing and drafting a review, new areas, new definitions of the problem and clarification of old issues will be encountered—to the benefit of the whole of the project. Secondly, the product itself will provide benefits to the readers. The review's guide to a writer's view of his/her own work and the significance of past debates is essential. It will invite thoughtful readers to think about their own understandings of Industrial Relations and to be aware, before digging into the core of the work, of their own pre-conceptions. It may also help to ensure, although there is no final guarantee of this, that the study is not criticised for failing to do something which was never its intention. In short, then, a review should, in its making, enable the researcher to write a better thesis and, as an end product, help the readers by making explicit purpose, assumption and theoretical underpinning.

REFERENCES

Bray, M. and Kelly, D. (eds) (1989) *Issues and Trends in Australasian Industrial Relations,* Proceedings of the Fourth Biennial AIRAANZ Conference, University of Wollongong.

Bray, M. and Taylor, V. (eds) (1986) *Managing Labour? Essays in the Political Economy of Australian Industrial Relations,* McGraw-Hill, Sydney.

Griffin, G. (ed.) (1990) *Current Research in Industrial Relations,* Proceedings of the Fifth AIRAANZ Conference, University of Melbourne.

Hyman, R. (1975) *Industrial Relations: A Marxist Introduction,* Macmillan, London.

Hyman, R. (1989) *The Political Economy of Industrial Relations: Theory and Practice in a Cold Climate,* Macmillan, Basingstoke.

Plowman, D.H. and Walker, A.J. (1989) *Australian Industrial Relations Thesaurus,* IRRC, Kensington.

Plowman, D.H. and Walker, A.J. (1985) *Industrial Relations Teaching, Theory and research: An Annotated Bibliography,* IRRC, Kensington.

6 Analysing Documents

Bradon Ellem

This chapter will explain how documents should be analysed. We begin, as ever, with questions of definition and purpose. Thereafter, the chapter will provide a simple 'how to' guide to understanding documents. Throughout, building on the previous chapter, the importance of understanding context, contingency and authorship will be emphasised. The main concern here will be to stress the importance of asking questions and thinking about all the possibilities and pitfalls in a particular piece of primary material.

At the very outset, it must be forcefully stated that practically every document which the researcher encounters is a socially constructed piece in itself, bearing certain values and assumptions. Even an apparently simple table of statistics must be looked at in this way. From day one, then, the researcher must be full of scepticism. Often, we need to ask questions as basic as 'why does this document exist?' That is, why are certain pieces of information recorded and tabulated? What significance should be attached to the very fact of existence? All this points to one warning: take nothing for granted. The most obviously straightforward documents may have many difficulties. Conversely, some lateral thinking may lead to new uses for old material and may energise the study of Industrial Relations—and the researchers themselves.

The focus in this chapter will be on primary materials. The difference between these and secondary documents sometimes strikes the novice as arcane and the words 'primary materials' seem to be invested with a mysterious and religious significance. At base, though, the distinction is straightforward: primary materials are created by the participants themselves (and so include oral records such as contemporary interviews which the researcher makes); secondary materials are the accounts or written discussions produced by others after the event. In the study of Industrial Relations, the distinction is less clear than, say, for historians, but nevertheless a line can be drawn. The boundary can be understood either in terms of time or, more clearly for our purposes, by

authorship. As hinted, there is also a distinction between written and oral sources. In some quarters, there has been a fierce debate over the merit of oral sources. At the risk of considerable simplification, it can be suggested that each has its own pitfalls and that each requires, as we will see, contextualisation and critical analysis. Both oral and written sources require careful work; it is not the case that one is inherently better than the other. Neither the past nor the present simply speaks to us. It is the job of the scholar to evaluate, balance, wonder and criticise. And these processes begin with the analysis of documents themselves.

At first, as with the literature review, the perplexing question will be: 'where do I begin?' To this, there is no straightforward answer, if indeed there is one at all. As with the question of beginning a literature search, it is often a matter of going to sources with which you may already be familiar or locating those which have been used in the work of others. In either case, there will be some materials which will be pretty obvious as starting points. This may sometimes involve the researcher in returning to the documents used by previous researchers in the field, which, although a time-consuming process, may be necessary, because, after all, no two investigators will have precisely the same sort of concerns or, of course, biases.

Deciding which documents to use requires the researcher to ask some questions. These are the same sorts of questions that have to be asked when actually engaging with the documents themselves, for example: who produced this—and why? What is the *central* purpose—stated or otherwise—of this document? How do my questions as a researcher relate to this? The choice of documents is critical and difficult—for two reasons. Firstly, because there usually is a choice; that is, there will be different ways of constructing evidence and argument, and, secondly, because the choices made will thereafter affect the development of the study. As with the secondary material and the literature review, there will be a dialectical process in which reader and subject almost work upon each other.

These points should be examined in a little more detail. To use a wide range of materials is most obviously useful because it readily gives some kind of balance. Industrial Relations is a very clear example of this, with the institutionalised conflict between employers and unions—and the records consequently produced by the participating organisations. However, there are far more subtle aspects of the question of balance. Using a range of materials allows for a greater feel for complexities within as well as between perspectives. This needs to be understood at the outset because the initial selection of documents may not always be the best informed. Therefore, the researcher needs to have a clear idea of the nature and limitations of any particular sort of primary source. Any document will look different, and perhaps begin to make more sense, when it is set alongside others.

This can be more fully appreciated if we again consider options and choices. First, as to options: they almost always exist and at first this strikes researchers as exciting—although, as deadlines approach, it becomes a pain in the place where you sit. There are different measures, accounts and views. There will often be different accounts generated by different sources within the one

organisation (or within the one individual in the case of the dissembling public figure). Of course, all researchers will be limited by constraints of time, but at the very least, they must take account of the very specific nature and aims of any given source.

As to choices: self-questioning is vital. It should never be simply assumed that one sort of document is obviously 'the best' or the only one available. Rather, some questioning is necessary. For example, students of Industrial Relations might well have to ask why they prefer certain materials as against others. Why the minute book and not the union journal, or the newspaper and not correspondence, or an organisation's own records and not those of another, observing, party? Clarity, honesty and self-awareness are essential here, in order to produce a rounded and convincing piece of work. Sorting out these matters will directly affect the look of the study; the two parts of the process—researching and writing—are in truth inseparable.

All of this tends to one more point, which is that there is very little to separate 'choosing' and 'analysing'. Fundamentally, these are symbiotic processes. Making a choice means that some analysis has already been done, albeit usually implicit and unrecognised. Once again, there are parallels with the literature search—the researcher must become aware of why certain materials are being chosen. Thereafter, the analysis will lead to further choices and there should be a greater tendency towards being explicit about aim and method.

When assessing documents there is one question which—with only a little exaggeration—ought to be asked at the outset, in the middle and after you've finished. It could well be put like this: 'Why is this person lying to me?' Most of us have little problem with using such an approach when watching election broadcasts, advertisements or other moments of snake-oil dispensation. Keep such a state-of-mind for research—especially when the argument or the material appeals to you. The old rule about foreign affairs should apply: never believe anything until it is officially denied. The point, of course, is always to question.

Questioning involves more than simple scepticism—although that is a good trait. There are also important skills which need to be developed. For example, there are some essential questions which will help in the process of de-mystifying a document. Firstly, who wrote or produced the document? Secondly, and similarly, in what contexts are the participants in the document speaking? Thirdly, is there something about the tone or style of the document which suggests anything? Fourthly, to whom might the contents be directed? Finally (for now), for what purpose might the document have been created and how might that relate to or differ from the purpose of a particular study? All these tend towards one over-riding issue: how credible is the document?

Taking the first two points as one, the question of production of the document needs to be addressed. Although there has always been a view that this is immaterial—a view growing in popularity, as the world becomes an ever less certain place—it is the case that Industrial Relations makes clear that *context*, *contingency* and *creation* are intrinsic to understanding the primary documents

one encounters. Two examples will suffice for now—both of which I encountered in writing about the clothing trades. The minutes of the Victorian branch of the union contain, in 1919, a convincing case for the virtues of Commonwealth arbitration. Read on its own, examined within its own terms, it would be little more than that—and many observers would see little to suggest any explicit 'biases'. However, put in the context of the union's history and the contemporaneous struggles within the labour movement, it becomes something else (and something far more interesting), for it is nothing less than one man's plea for his life's work to be continued and for the union to steer away from the revolutionary industrial unionism of the IWW. Then, about sixty years later, there is a calm and reasoned explanation of why technological change had not undermined skill in the industry. A reader might be tempted to use this as evidence in an attack on the Braverman de-skilling thesis. There is a slight problem though. The source is a union official arguing for wages in a work-value case. In both these examples, the points-of-view might well be perfectly legitimate, but it would be a brave writer who would plunge in without considering those contexts and the motivations behind the voices.

Secondly, even when there seems to be little problem on these fronts, or when they have been taken into account, there are still difficulties which suggest that the text itself merits close examination. Sometimes this can mean simple things, albeit traps for the unwary, like rank sarcasm or more subtle irony. Having picked up something like this, it is then worthwhile to think about why an author wanted to write in that way and what that means. Read between the lines for hints in the tone about deference or defiance and the range in between which make up the spectrum of social relations at work. Ask questions that—though basic in themselves—may open up some new areas of research. For example, think about whether or not attitudes expressed in a document might be different if the speaker were of the opposite sex. Think about whether or not the document itself, in its very form, denotes anything.

The question of the likely audience is also critical in Industrial Relations. The arbitration arena as against the union meeting is a great example of this. Should we judge, say, union officials on their performances before a tribunal? To what extent will they be conforming to the procedures and discourse laid down ahead of them? Are the militant ones losing their politics or merely putting demands into acceptable 'court-speak'? More broadly, how might a prospective audience affect the way in which individuals or organisations prepare documents? Indeed, are there senses in which the audience was present at the making of a document?

Some of these points have addressed the fifth and final question above: the sometimes differing purpose of document and student. In a way, this will always happen and it should solve the problem of overlap between thesis and sources. This refers to the problem, often encountered, of the thesis being little more than a summary of a set of primary sources. A thesis really should be an argument—and that means that it must, inevitably, be bending, and all but breaking, the primary materials it uses. (But never quite breaking them. Not only is that cheating, but it is to deny any authenticity to them. If you get to that

stage, abandon the social sciences for theology).

Thus far we have stayed within the bounds of some standard questions and looked at the documents as—not value-free—but as inclusive materials. This itself is an assumption which needs to be examined. We should never assume that a document, or even an archive or library full of them, will tell us all about the makers of that material. For a start, and most obviously, there will be values and assumptions so deep or so shared that they will never make it onto the page. Unlike the old positivists, we must assume that not all things will be recorded, measured, stated. Only under threat or as the world changes will, perhaps, the most important statements be made. So, a very basic question to ask is one to do with what gets into records in the first place and in what form and at what historical moment.

Some of this may seem a bit obscure to the students and players in Industrial Relations. However, these questions are at least as important here as elsewhere, that is, in an area that begins with work and income, but ultimately is to do with politics and power. We know that ideas and values run through all these concerns and we should not try to hide from that in studying and writing about Industrial Relations.

What has been half-glimpsed in this chapter are the questions of context and contingency. That is: how do particular documents and the experiences and values they represent relate to the world around them? How does one document or set of materials relate to others? And how do we account for changes over time and variations between items? Upon what, then, is any one problem or piece of evidence contingent? All of these questions are ones which should be in the researcher's mind at all times. It is essential to start with theories, hypotheses and questions, but it is no less important to qualify, modify and re-think as the work proceeds. Otherwise, research is unnecessary and documents merely obstacles in the path of a chosen world view.

7 Finding The Law

Brian Brooks

INTRODUCTION

Those who embark upon legal research face several problems. First is the sheer mass of the material. A visit to any law library will reinforce this point. Second is the fact that the law changes rapidly. Parliament enacts new legislation each year and the courts develop and refine legal principles constantly. Compounding this problem is the fact that within the political federation of the Commonwealth of Australia, there are parliaments in the federal jurisdiction, in each of the six states and in the Territories. In addition, of course, there are courts in each of those jurisdictions. And, to further complicate matters, those courts follow English precedent in many areas and those parliaments were established by Acts of the British Parliament. This means that legal research often entails looking for and applying English law which will be found in English law reports. Third is the fact that *commentaries* upon the law tend to be always a picture of the past simply because the law is changing fast. Fourth is the problem facing all researchers: the level of knowledge of the researcher. Clearly, it is much easier to research in an area with which the researcher is broadly familiar. This is relevant to those trained in the law. It is of especial relevance to those whose first discipline is not the law. And that leads to the final problem. Even for those with a legal background, the obscurities of legal language, the mystique of legal concepts and the oddities of legal history present constant problems. This becomes a particular difficulty for non-lawyers. In effect, the non-lawyer who embarks on legal research is learning a new language. A research project is based on classification. Classification and categorisation is central to all legal analysis but how issues are classified in law is a topic far beyond the bounds of this small chapter. What we can say with confidence, however, is that a person embarking on *industrial law* research has a clear advantage.

Industrial law is a well-defined area of enquiry and a researcher will doubtless come to the area with a working understanding of Industrial Relations and,

therefore, of the legal framework. In Australia more than in almost any other country, Industrial Relations *is* industrial law. Thus the Australian researcher will be familiar with section 51 (xxxv) of the *Constitution*, of the role of the High Court in interpreting the *Constitution*, and will be familiar with conciliation and arbitration legislation, the award-making process, the law surrounding employer associations and trade unions, as well as a wide range of legislation regulating such matters as occupational health and safety, workers' compensation, paid leave and the like. In addition, as we shall shortly see, the person who wishes to research labour and industrial law in this country is well served by accessible primary and secondary sources.

WHY SEEK THE LAW?

As a generalisation, it is safe to say that Industrial Relations researchers turn to the legal sources in order to obtain *authoritative* legal statements on the rights and duties surrounding the employment relationship at both the individual and the collective level. We seek the *relevant* law governing the contract between an employer and an employee and the *relevant* law which regulates the dealings between employers and their organisations and workers and their organisations. As in any area of legal research, an exploration of labour and industrial law necessarily entails an understanding of legal history.

WHO MAKES THE LAW?

The Australian legal and political system was imported from the United Kingdom in the eighteenth century. While it is true that the Westminster system has been refined to accommodate peculiarly Australian needs, with federation being an obvious example, it is equally true that Australia retains the law-making system of the United Kingdom. The essential elements of that system are that law is made by (i) parliaments, (ii) persons or bodies to whom parliament has delegated power to make laws, and (iii) the courts. What this means is that legislation, the common law (or judge-made law), awards and industrial agreements, and the pronouncements of many industrial tribunals are all sources of labour and industrial law.

WHERE WILL WE FIND THE LAW?

We may conveniently divide our research area into primary and secondary sources.

1. Primary

(a) Legislation

Legislation, or statute-law, is *the* primary source of law in all areas for the simple reason that parliament is the supreme law-maker. When parliament

speaks, it does so through an Act of Parliament. An Act of Parliament overrides what a judge decides in a court and the accepted function of a judge when faced with a piece of legislation is to give effect to the intention of parliament. Furthermore, because life is complex, parliament is unable to pay attention to every aspect of human affairs and will, therefore, delegate to others the power to make laws. And, as will be very well-known to any student of Industrial Relations, parliaments at the federal and state level have enthusiastically passed laws regulating working relationships and have equally enthusiastically delegated law-making powers.

(i) *Legislation.*

No point would be served by listing the legislation. What is important to note is that *statutes* are printed and published and updated from time-to-time. A statute may be purchased from federal and state government printers, or may be found in libraries, including most state public libraries. Statutes are frequently reprinted either in the form of a pamphlet or in general volumes. The general reprints are useful as they are often updated through supplements and, in addition, the general, bound reprint will contain tables, an index and annotations. Valuable research tools lie outside the statutes themselves. These are found in various kinds of tables, indexes or annotations. The statutes themselves are easy to find. An obvious starting-point is to consult secondary sources such as legal digests, legal encyclopaedias and legal textbooks and to locate the statute through its subject matter. Once the subject matter has been identified and the name of the Act established, then determining the current state of the law begins with the latest reprint of the legislation. When the legislation is a Commonwealth Act a researcher is advised to consult *Annotations to the Acts and Regulations of the Australian Parliament.* This is published by Butterworths and it consists of a permanent bound volume which is updated each six months by a supplement. The main volume should be used first. The required Act will be found listed alphabetically and the date of the latest reprint will be given. Each section of the Act will disclose whether or not is has been amended and the amendment will be indicated. Where amendments are indicated a search of the *Supplement* is necessary following the same steps as with the *Annotations*. Butterworths also publishes *Statutes Annotations* in the various states.

(ii) *Delegated legislation.*

The most common form of delegated legislation is found in the various Regulations and By-laws which regulate such matters as dangerous machinery, wood-working, dust-diseases and the like. Power to make regulations and by-laws will be found in the parent legislation described above. The delegating Act will be called 'the enabling Act', that is, it will enable a person or body to make

subordinate law. An obvious example of delegated law-making in Australia is found in the functioning of industrial tribunals and the making of awards. There has been considerable debate over the nature of an award, but the resemblance to delegated, or subordinate, legislation is clear. Furthermore, awards and industrial agreements are highly accessible. Not only is it an obligation to display the relevant award at the workplace, but the responsible government department, state or federal, will provide copies and advice, as will the registrar of the relevant industrial tribunals. Awards, and their interpretation, may be found in several publications. In the Commonwealth jurisdiction, recourse should be had to the *Commonwealth Arbitration Reports* (CAR). In the state jurisdictions are found similar reports. Examples are the *Industrial Arbitration Reports, New South Wales* (AR NSW), the *South Australian Industrial Reports* (SAIR) and the *Western Australian Industrial Gazette* (WAIG).

(b) Case-law

Case-law, sometimes described as 'judge-made law', is published in *Law Reports*. There are several series of Reports in each jurisdiction, one series being the official, or authorised, series. The Reports are the written judgements of a court on points of law. Not all cases are reported. It is those cases in which a fresh insight is offered, or in which our understanding of a legal principle is expanded, which are reported. For this reason, most lawyers tend to consult the official, or authorised, Series of reports of superior or appellate courts. This is true also for the labour and industrial lawyer. The most useful series for labour law research are: *Commonwealth Law Reports* (CLR), which are the authorised reports of the High Court of Australia: *Federal Law Reports* (FLR) which contains, amongst others, the decisions of the Australian Industrial Court; and the *State Reports* in each of the six states. In addition, there are specialist series which the labour and industrial lawyer will consult. An obvious example is the *Australian Industrial Law Review* (AILR), the contents of which are revealed in the title. The AILR has a useful index which is divided into several parts: a general or topical index which carries references to all cases reported; an index of industries or callings; an index of awards; an index of agreements; an alphabetical case study and section finding lists which facilitate locating cases dealing with any particular legislative provision. Others are the reports mentioned earlier, such as the CAR and the AR NSW.

(c) Industrial tribunals

Industrial tribunals are specialist bodies, the operations of which are centrally important to labour and industrial lawyers. In each of the jurisdictions, federal and state, will be found an Act of parliament establishing a tribunal. Examples are the Commonwealth *Industrial Relations Act 1988,* which established the Industrial Relations Commission, and, in New South Wales, the *Industrial Arbitration Act 1940,* which established the Arbitration Commission. The legislation in the Commonwealth and in the six states prescribes the powers and

the procedures of the tribunals. The decisions of the tribunals are reported in the AILR, the CAR and the AR NSW, amongst others.

2. Secondary

Acts of parliament and reported decisions of judges are authoritative statements of the law. They are pronouncements of law-making bodies. An Act of parliament is *the* paramount pronouncement of the law. A reported judgement carries more weight the higher the level of the court from which it emanates. Broadly speaking, the pronouncements of a higher court bind a lower court when that lower court is considering a similar question on similar facts. In this loose sense, lawyers talk of a doctrine of precedent. A person researching law needs, therefore, to understand the several levels of Australian courts. Briefly put, the hierarchy of courts ascends from Magistrates, to intermediate courts called District Courts, to superior courts in each state usually called the Supreme Court, to the highest court on the ladder which, not surprisingly, is called the High Court of Australia.

Secondary sources are *not* authoritative statements of the law and, unlike, say, a reported High Court Decision, they are not binding. Instead, they are publications which summarise and analyse the law. At the same time, such publications may go further and engage in critical commentary upon the law. The most familiar secondary source is the standard textbook. But there are other secondary sources, including legal digests, legal encyclopaedias, legal dictionaries, legal periodicals, loose-leaf services, government publications, parliamentary publications and non-legal sources.

(a) Textbooks

Of recent years, there have been a number of textbooks and commentaries of real use to research into labour and industrial law. Indeed, it is suggested that the starting point should always be textbooks and commentaries, remembering that it is important to ensure that the most recent edition of the book should be used. It is not possible to provide an exhaustive list nor to describe the contents of the various books. The following selection is nominated as among the more recent and useful. The titles will indicate the scope of the work. Each book contains a comprehensive bibliography.

Brooks, A.S., *Guidebook to Australian Occupational Health and Safety Laws* (CCH Australia, Sydney, 3rd.ed., 1988)

Brooks, B.T., *Contract of Employment: principles of Australian employment law* (CCH Australia, Sydney, 3rd.ed., 1986)

Creighton, B. and Steward, A., *Labour Law: An Introduction* (The Federation Press, Sydney, 1990)

McCallum, R.C., Pittard M.J., and Smith, G.F., *Australian Labour Law: Cases and Materials* (Butterworths, Sydney, 2nd.ed., 1990)

Macken, J.J., McCarry, G., and Sappideen, C., *The Law of Employment* (Law Book Company, Sydney, 3rd.ed., 1990)

Punch. P., *Guidebook to Australian Industrial Law* (CCH Australia, Sydney,

4th.ed., 1984).

(b) Digests

A digest is an index and summary of reported judicial decisions. There are two digests of especial interest to labour lawyers. The first is *The Digest,* which was formerly entitled *The English and Empire Digest.* As the title indicates, this contains English decisions. For Australian decisions, we turn to *The Australian Digest* and its updating service, *The Australian Legal Monthly Digest.* The digests assist in finding cases and articles. Research should start with the subject index or the table of cases. Cases are arranged and classified and a brief summary of the facts and the legal principles involved is provided.

(c) Legal Encyclopaedias

A legal encyclopaedia is more comprehensive than a digest. An Australian encyclopaedia is in preparation, but in the absence of this publication, the two most useful are the famous *Halsbury's Laws of England* and *The International Encyclopaedia for Labour Law and Industrial Relations.* The former has an *Australian Commentary,* including one devoted to labour law. The latter is useful for comparative research and has a special section on Australia. The encyclopaedias are a very useful starting point for research. They are written plainly and concisely and are designed to assist a reader who knows little about the subject.

(d) Legal Dictionaries

Clearly, a Legal dictionary will be useful for non-lawyers unfamiliar with legal maxims (which are often in Latin). There are a number of publications. Possibly the most useful is the *CCH Macquarie Concise Dictionary of Modern Law.* Among other things, it contains case names and Australian legal abbreviations.

(e) Journals

The textbooks and digests will contain bibliographies which include reference to journals and periodicals. Libraries will have a *Serials Catalogue* enabling researchers to find journal articles. In addition, there are journals of specific relevance to labour and industrial law research. The two most obvious are the *Australian Journal of Labour Law,* published by Butterworths and edited by Richard Mitchell, *The Journal of Industrial Relations,* edited by Braham Dabscheck at the University of New South Wales. There are numerous legal periodicals and many contain articles of interest to labour law research. Special attention should be paid to *The Australian Law Journal.* In addition, there are centres for the study of Industrial Relations and they publish papers of interest to labour lawyers. An example is the Industrial Relations Research Centre at the University of New South Wales. A number of tertiary education institutions have similar Centres and they publish papers, monographs and textbooks.

(f) Loose-leaf services

CCH Australia publishes a series of loose-leaf services in the area of labour and industrial law including a four-volume *Australian Labour Law Reporter* (with a comprehensive Index), the *Australian Employment Legislation*, the *Australian Industrial Law Review*, the *Australian Industrial Safety, Health and Welfare Reporter,* as well as other series which report workers' compensation law and equal opportunity law.

(g) Government publication

The prime example of government publications are Acts of parliament, which were discussed above. In addition, each government, federal and state, has its own publishing service. In 1987, the National Library produced an exhaustive list of all government publications, (federal, state and in the territories), in *Australian Government Publications*. Of particular interest to labour law researchers are the reports of various committees of inquiry and the position papers issued by governments. One valuable document is the three-volume *Report of the Committee of Review into Australian Industrial Relations and Law* (the Hancock Report), published by the Australian Government Publishing Service, Canberra, in 1985. The *Report of the Committee of Inquiry into the Industrial Conciliation and Arbitration Act 1961-1987 of Queensland* (the Hanger Report) was published in November 1988. In February 1989, the New South Wales Government published a Green Paper prepared by Professor J.R. Niland entitled *Transforming Industrial Relations in New South Wales* and this was followed by a Discussion Paper in October 1989 entitled *Occupational Health and Safety: Transforming Industrial Relations in New South Wales*. These, and similar, publications contain useful material for those researching labour and industrial law.

(h) Non-Legal publication

All libraries, whether specialist law libraries or not, will contain reference sections useful for law research. Aspects of legal history, of economics and of politics are likely to be relevant. There are also the newspapers and other non-legal periodicals which will carry items of interest and relevance. Of especial value is the loose-leaf newsletter *Workforce,* published by Newsletter Information Services, which also publishes other services of relevance to labour law and Industrial Relations. Peak Councils of employer organisations and of trade unions also publish handbooks and guides to recent developments in labour law and Industrial Relations. For example, the Confederation of Australian Industry (CAI) in October 1988 published a *Handbook on the Industrial Relations Act 1988*. In 1987, the Metal Trades Industry Association (MTIA) published a *Handbook on Employment Law and Practice,* written by R. Boland and N. Andersen. The various state Industrial Relations societies will, from time to time, publish papers and, in particular, the proceedings of their respective Annual Conventions.

HOW DO WE USE WHAT WE'VE FOUND?

(a) Primary sources

There is no shorthand way to explain how to read an Act of parliament or a reported case. These are specialist skills which are slowly acquired over time. Nevertheless, there are some basic points to keep in mind.

(i) *Legislation*

Once you have found a section of an Act which is relevant to your research, you will find that the legislation itself contains research aids. These will take the form of tables of provisions, indexes, footnotes, marginal notes and section headings. At the same time, you may need to go outside the Act to find assistance in interpreting the provision. Amongst these outside aids will be earlier cases which have interpreted the Act or sections of it, authoritative texts and articles in various periodicals and journals. Cases can be found by using the *Annotations* to the statutes.

(ii) *Reported Cases*

The reported decisions of judges are used as precedents. Judges express the law in their decisions. When you have found a relevant case, it, like a statute, will contain its own aids to research. Reports follow an established format. In *Studying Law* (Branxton Press, Sydney, 2nd ed., 1987), Christopher Enright explains that the relevant parts of a reported case can be described in sequence from the first page. Thus he says that at the top of the first page are the names of the parties, which gives the name of the case, and the name of the court, which is important 'as the status of the court determines the standing of the case as a precedent'. Catchwords come next. These give a brief indication of what the case is about and include references to any relevant legislation. Beneath the catchwords is the headnote. This is a summary of the facts and a summary of the reasons for the decision. The nature of the hearing is explained and this is followed by a summary of the facts and a history of the proceedings. The names of the barristers and solicitors are given, a summary of the cases used in the arguments is provided and the date of judgement. Then the report will provide the substance of the case. In other words, the judgement(s). There is no formal, standardised method of writing, or reporting, judgements but as a general proposition, it is safe to say that you will find in each judgement: a statement of the facts; a summary of the issues; the reasoning; the conclusion; and, finally, the order or finding. While the order or finding is given by the judge(s), it is usual for the formal report to record the order or finding after the judgement(s). Two final matters are included: the name of the firm of solicitors and the name of the reporter.

It is important to be aware that the catchwords and the headnote, while invaluable as a guide to the issues and the decision, are *not* a substitute for reading the judgement(s). It is in the judgement(s) that we find the law. The trick is to know what exactly *is* the law in any given judgement. As a rough rule-of-thumb, the reader looks for those steps in the judgement which are necessary to sustain the conclusion. These steps are separate from judicial comments not strictly relevant to the conclusion. The former steps are said to represent the *ratio decedendi* of the case, that is, the principle(s) of law for which the case is authority. The latter are called the *obiter dictum*, that is, incidental sayings which, while of interest and value, are not an essential part of the reasoning behind the decision.

As with statutes, so with cases, it may be necessary to look outside the report for assistance in understanding the case. These aids will include later cases which may have explained the principle of the case first read, authoritative textbooks and articles in various periodicals and journals. Most law journals publish regular case-notes of significant reported decisions. Cases, and commentaries on them, are found by using the *Digests*.

CONCLUSION

The research methodology discussed in this brief chapter may be reduced to three steps:

(a) Start with the secondary sources—a textbook, or a commentary in the various journals and periodicals, which contains an explanation of the broad area of law and the principles involved. It is important to have this broad overview and broad understanding; without this, you will follow false leads. The secondary source will refer to relevant primary sources, that is, the statutes and the reported cases.

(b) Go to the primary sources and check that the law is up-to-date by following the procedure explained above.

(c) Thirdly, confirm that the commentaries have properly expressed the law, and reinforce your understanding, by using the various aids to the interpretation of statutes and reported cases.

8 Informal Sources and Tactics

Ross Shanahan

There is a subtle contradiction involved in talking about informal sources of data for research. It is contained in the fact that research implies an effort to bring some order out of disorganised information, to impose some form on formless data. It implies making an organised argument which will support a guess about outcomes or confirm or undermine one already made. So what then are the uses of informal sources in this highly formal activity? They can scarcely be cited as evidence in the text without weakening the ironclad assurances of the rest of the report. Are they then no more than a distraction? This chapter will argue that informal sources and methods of research, far from being a dilution of scholarship, give some life and power to research which antiseptic and sterile processes all too often lack. The trick is to see that the formal research piece or report, though conceived no doubt in hope and with enthusiasm, often begins life as a messy, helpless, misbegotten idea, looking not at all like the studies and academically manicured entity it is likely to become with proper rearing. While the research is on the way from its infancy to maturity, informal sources of data are often useful in marking out pathways, challenging false assumptions, stimulating responses, and occasionally injecting a bit of humanity. I am certainly not the first to say that some of the progeny of research would be improved by it.

What is usually meant by the term 'informal' is information that comes from sources not normally recognised or quoted in official research papers. Sometimes, all this informal selection process signifies, in effect, is that the material selected out does not fall within an Industrial Relations perspective, narrowly defined. On occasions, it means that there is no didactic intent in the manner of its presentation. Other times, it means that the material has been written, collected, put together by someone who 'only works there'. In general, it is the sort of material for which there is little empirical evidence in formal documentation or records, but it has the ring of truth about it.

In your restless pursuit of truth in your project, you will bump into disturbingly

different information coming from unexpected sources from time to time. What sort of recognition you accord it is the issue before us here. You will receive plenty of advice, without doubt, about using the resources of the libraries. After you have been exhorted to look into all the journals from the libraries, even those off-campus, or the special purpose ones (like the law library, the documents from the Industrial Commissions, and so on), there are still some informal sources to check. You may find that the less academic magazines in bookshops also have something to say about the business of earning a living, in all its diversity. Take, for example, *Australian Business*, or *Business Review Weekly*. These are magazines constructed to supply a quick update on what they perceive to be the interests of their readers (mostly managers) in the marketplace. Virtually everything that they present has a bearing on aspects of Industrial Relations. What you need to know is that they are written for a particular clientele and that they probably tell the truth, as they see it, to their readership. They are more topical than the academic journals and certainly more lively. They aim to tell their clientele what they perceive to be worth knowing. They can be spectacularly insightful or spectacularly wrong in their evaluation of 'worth knowing'. Either way, they are stimulating and useful to the researcher looking for the peculiar bent of popular culture and the comment of the marketplace on Industrial Relations issues.

The magazine discourse, however, does not need to be confined to the titles that have an obvious affiliation with the area of Industrial Relations. Sometimes, the most insightful comment can come from productions with a different focus that happens to overlap from time to time with Industrial Relations. Titles like *New Scientist* (for incidence of RSI), *National Geographic* (for the lives of miners on strike in South Dakota), *Land Rights News* (for worker/Aborigine solidarity), and *Family Matters* (for your wages), fill in a variety of perspectives for researchers working in Industrial Relations. There is a further rich field in the sports magazines (for professionalism and contracts of employment), motor magazines (for concentration of manufacturing endeavour in the motor trade, and overseas dependence), and tourist and small business concerns (for issues of penalty rates). A short trip to the local deli will show the range and extent of popular magazines, even excluding women's interests magazines that look at women's place in the job market and the accompanying sets of attitudes that are assumed to legitimise this.

So what is the advantage of knowing that this mass of unformulated opinion is out there waiting to be sifted by the informed researcher? One of the advantages is that the popular discourse surrounding your problem can be a help in making what you write relevant to a wide readership. If what you write does not come to terms with, answer or refute what is popularly thought or said, it runs a great danger of being out of touch or rejected or thoroughly futile. Good research deals with real problems. That it does so with means and methods that are not themselves popular does not remove it from having to deal with the issues as they are popularly perceived. Such perceptions are precisely located in these artifacts of modern society—popular publications.

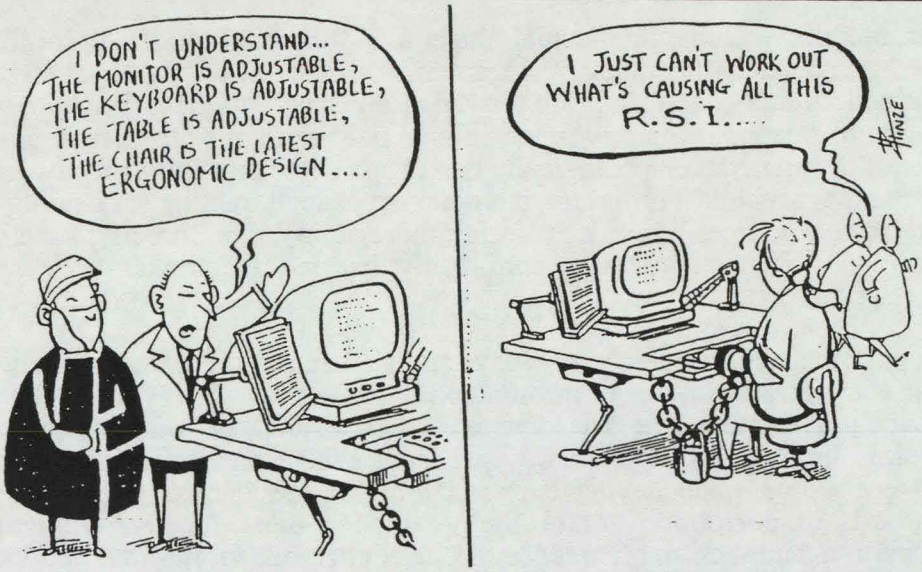
Lest anyone should construe what has been said as an invitation to dissipate

your attention in some intellectual binge on soft-centred nonsense, it must be added immediately that much of the material will be flawed. It may well be ill-informed, in that conclusions are arrived at on shaky grounds. It may contain wrong information. There is the occasional deliberate misinformation as well. Most of this material is ideologically bound and some of it is politically driven. Sorting it out will be a difficulty, but doing so is good training for dealing with more formal sources which may suffer, more subtly, from precisely the same limitations. We cannot assume confidently that only the popular press has an axe to grind.

The pulp magazines are in many ways an extension of the newspapers, which are still the greatest source of information in our society. Every researcher will be encouraged, more or less as a matter of course, to create a file of newspaper clippings on focal subjects. Newspaper reports themselves often pass for hard data as a source, since they have the reliability of frequency of publication and standards of corroboration for their evidence that are ensured by their competitors and their public readership. Yet everyone knows that you cannot believe everything you read in the papers. Even less can you believe the lesser dailies, the tabloids which run as vehicles of entertainment first and purveyors of news second. What these do best is get in touch with the flesh and blood aspects of questions and those which are heightened by personal drama. In the words of C. Wright Mills, their stock-in-trade is 'the personal troubles of milieu'. They leave the 'public issues of social structure' (Mills, 1959:8) to the researcher. If such a one is alive to the connection between the two—'personal troubles' and 'public issues'—there will be no closing out of personal troubles as sentimental or irrelevant. The research indeed will be informed with the warmth and the passion of real people operating within the framework of industrial structures. The tabloids may help with that grand aim.

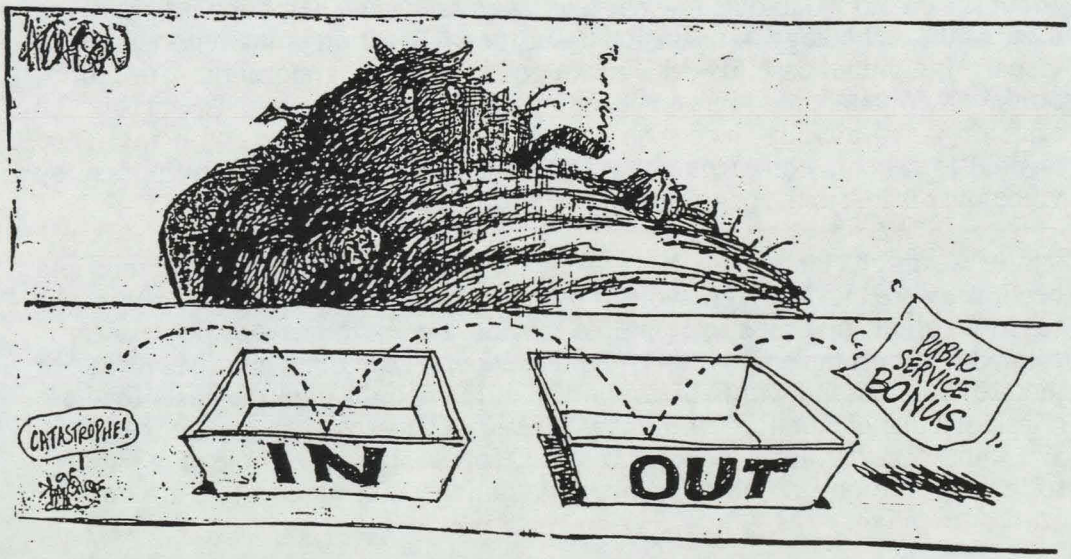
What is said of the tabloids must be applied to television news and reports. The logic of the technology of television limits the imagination of the reporters to the visual. Individual case histories make good visual programming. Structures, on the other hand, are too abstract for lenses, as a general rule. The bias of the craft of video-making insists on concrete, visible evidence, with inference limited to capsule commentary. As often as not, even the snappy phrase by voice-over is lost in the pageantry of the next images.

While we might lament the poverty of the visual in revealing structure and become aware that one right word is worth a thousand pictures, we need not be so down about that most cerebral of visuals, the cartoon. As the cartoon is created to distort the obvious to reveal the hidden, it can often encapsulate in one picture the thousand words of a report. Let me demonstrate the case, for I am conscious that elaborating cartoons is at least as anti-social as explaining jokes. We should rather let a good one speak for itself. Just look at what this following cartoon says about technology management. It comes from *Labour Studies Briefing*.

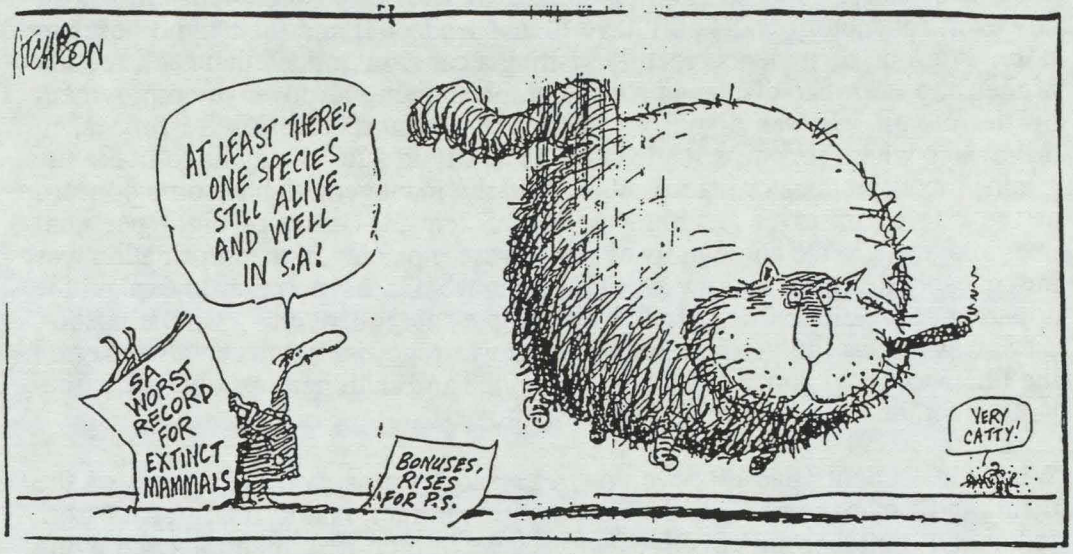


Heinrich Hinze in 'Labour Studies Briefing', Summer 1990/1991 p 27, Labour Studies, University of Adelaide.

Cartoons are weapons of war too. While putting this chapter together, to exemplify my point I made a selection of just one month of cartoons from *The Advertiser*. Three of them are reproduced here. The fusillade of symbols used, however hackneyed you find them, is aimed and fired with total malice aforethought at the class enemy. The cartoonists' skills have been bought and applied for the routine harassment of an identifiable group. The passionate edge of a power struggle within our society, which a researcher may be striving to capture in words, is clearly on display.



Atcheson in 'The Advertiser', Adelaide, Nov 7, 1990



Atcheson in 'The Advertiser', Adelaide, Nov 10, 1990

Bateup in 'The Advertiser', Adelaide, Nov 11 1990

A fully fledged sociologist would want to go further in the pursuit of social tensions and use the cryptic messages of legitimate and illegitimate vandalism, that is to say, commercial hoardings on the one hand and the graffiti that festoons the walls of our cities on the other. Unfortunately, both these sources

have been largely debased and trivialised by over-exposure. All is not lost, however, for factory walls still have their tales to tell and their hypotheses to raise. A group of students recently visiting a car firm noticed that each section of the shop floor had displayed for it a graph showing turnover of employment by the month. It was displayed, however, on inaccessible wire fences, in driveways where fork lifts loaded and generally in such a way as to make the graphs inconspicuous or inaccessible. Clearly, management had some concern at the rate of turnover (as high as 35 per cent at a time of eight per cent unemployment in the community at large), yet the placing of the information was inexplicably designed to draw attention away from it. Hypotheses to explain the apparent contradiction flew thick and fast in a subsequent class. In the upshot, there was no resolution of the riddle, but it was reported that when a worker on the line was asked about it, he simply laughed and said, perhaps obliquely, that he thought the turnover rate was probably higher!

What the students had discovered, in research terms, was that some of the meaning of management behaviour could be, in fact, had to be, inferred from indications that their unreflective actions gave of their real intentions. Drawing inferences from this sort of evidence is not a mysterious thing for people to do. Indeed, it is the common coin of much of our normal discourse. Cartoonists thrive on it. Psychologists like to try to decipher body language by inference. No matter what hard-headed people may think of it, there is no doubt we all use a kind of psychic antennae for picking up social static. In research terms, the clue we find is called an index. From the index, we infer the meaning of the behaviour that generated it. It can be great fun sometimes, as when we infer the reading preferences of adolescent school boys by observing which pages of *Lady Chatterley's Lover* are the heaviest thumbed. Or as Webb recounts, how the museum administration could tell the most popular exhibit by noticing which part of the flooring had to be renewed most often because of excessive wear (Webb *et.al.*, 1966). The index is the link between the idea and the research. Testing the idea, the guess or the hypothesis, on the ground, so to speak, means discovering some way to observe behaviour, note frequencies, see patterns and so on from which a plausible inference can be drawn. The strength of the inference will vary from case to case, but there is no doubting that the process leads to further reflection and creativity and brings together thought and the process of research.

The frequency with which topics or issues are mentioned is a common index of salience. In my cartoon example above, the very repetition of the images was much more significant than the sharpness of their social comment. Frequency analysis is one of the bases of evaluation of formal documents. Indeed, by using a little reflective thought on our own behaviour, we can infer something about Industrial Relations practitioners by observing what they most frequently research (Ferris, 1988: 11).

Frequency indicates close attention to a topic. Certain groups focus their attention very precisely and comment frequently on matters that reflect on Industrial Relations. We often call them 'pressure groups'. Pressure groups are interesting, not only for the frequency with which they address their special

topics, but their particular angle on events can give their publications a curious creativity. Some call it bias. Bias, thus defined, can give an edge or a point to a view that more objective analyses simply miss. Naturally, of course, we should remember the philosophical dilemma that attempting to take a position of total objectivity is also to demonstrate bias, under this definition. The bias, then, need not be reckoned particularly destructive of the validity of our investigations, so the good researcher will check the various lobbies for creative insights into industrial issues. Welfare organisations, for example, present a credible view of the world through the eyes of their constituents; as do Chambers of Commerce, taxpayers' associations, the Australian Medical Association, employer organisations, farmers organisations, working women's centres, small business associations, automobile associations, St John's, the Churches, trade unions, gun clubs, and so on. Most publish their positions on matters of interest to them. The published material is, of course, hard data if the question at issue is the formal stance of the groups concerned. More importantly, if less explicitly, an editorial analysis of their publications often given the flavour of the network that the group represents and the unacknowledged assumptions on which it operates.

There is nothing quite so good for getting into the attitudes of the community as talk-back radio. Despite the censorship of 'bad taste' that is imposed by virtue of radio's public responsibilities, talk-back gives an insight into prevalent views that the researcher can use to clarify the argumentation of his or her research or to understand the enormity of the distance between logical positions (the researcher's, need I say) and the ideologically tainted positions of the populace (the talk-back participant—or the radio announcer) on Industrial Relations. One of the great strengths of this method of tapping attitudes and opinion is the unselfconscious contributions of the participants. There is little or no pollution of the response by suggestion from the observer, a frequent problem in formal surveys. The respondent merely feels impelled to air strongly held opinions or commonsense perceptions of the world. There is little verbal fencing and trickiness involved as a rule.

The process has a swampy fascination for those who get into it. On late-night talk-back, the writer, in a temporary condition of absence of mind, once defended the Plumbers and Gas Fitters, who had been accused of holding a building developer to ransom by asking for a renegotiation of special allowances towards the end of a project. The argument pursued was that, as the conditions of work had been substantially changed, to get the job finished on time the contract could be renegotiated. There was a storm of disapproving opinions, the burden of which was that a contract of employment is unchangeable; attempting to renegotiate contracts at the instance of the employees is tantamount to blackmail (the word was used freely), and so on. This seemed to be a convincing demonstration, if one was needed, of the strength of the master and servant-status relationship, in the minds of the servants (I presume) as much as the masters, within the community. The miasmal quality of the debate ensured that the station had a murky topic for another session the next night. I do not suggest, of course, that a researcher should become an agent provocateur in these debates, if only for fear of losing the spontaneity they generate.

Nevertheless, some gauge of the attitudes of the insomniacs (at least) of our society can be grasped from close attention to them. Which thought suggests an interesting, if marginal, hypothesis, namely: there is a significant correlation between sleep disorders and racist attitudes in the Australian workforce!

No doubt formal interviewing will always have a place in good research methodology. Indeed, the formal interview is a champion arrow in the researcher's quiver. Informal interviews often hit the target too. The point of the informal interview is often to get a line on the formal one. Every good reporter knows that sources need to be checked. All good methodologists try to get a triangulation of approaches on sources of information. If data stand up to checking from several disparate sources, they are probably strong and may be included in the formal record. The informal interview seeks to find out the persons who have special, even if limited, knowledge. They include the old who can fill in the history of an issue, the authoritative or observers on the spot without special personal interests to serve or those with expertise not usually related to contributing to the written record. Often the corroboration sought applies to just one element of the issue, with the whole picture being constructed by the researcher. Whatever the particular function of any given informal interview, its strength is its informality. Get formal and the respondent will dry up. Just ask the questions and listen. All the body language of easy conversation, the nods and grunts and mobile eyebrows, help no end. If you must use a tape recorder, then you had better explain its use well in advance and record a lot of chit-chat before you get to the question that matters for your purpose.

Some distance further along the informality spectrum is the information that is gleaned rather than harvested. If you want to know what the personnel man thinks of Work Cover, listen in to golf-club change room chatter or the equivalent. There is a good chance that his views are not represented in the official record anywhere. Nor would they be expressed for public consumption in the formal interview. By the same logic, I can speculate, never having had the opportunity to test this guess, that the expensive women's hairdresser gets very accurate information about the shareholder's views of the Bank Employees' Union and Saturday trading. Certain hotel bars after the fortnightly executive meetings of the local union fulfil the same function. Once in a while, the well-placed question in any of the above venues is interesting. 'Did you see that article about the pickets at Alloy Machining?' Could be they did and want to talk about it from their class perspective. A good researcher listens and notes the conversation soon after.

These suggestions are the peripheral elements of participant observation in all its forms. They are the stock-in-trade of social investigators, anthropologists and oral historians. They produce data that are immediate, broad-ranging, and more-or-less easily accessed. The data elicited indicate personal perceptions, interests, bias, ideologies, social relevance and attitudes, and, like the proverbial police blotter, they are often the only accurate record of events otherwise fudged in formal reports. Inferences drawn from a number of these sources taken together can establish with considerable precision the balance of probability about a given

problem, especially where formal reports say nothing of the detail under review. The disadvantages of the material are that it is patchy, rarely argues or is organised in advance, and it is often entirely self-serving. It regularly represents leaps of inference that reflect more on the preconceptions of the respondents than on the quality of the evidence.

For all their waywardness, the data of informal sources have been used to great effect in some of the classic works of complex research. Would-be researchers cannot be urged too strongly to read some of the accounts of how it comes together and how it really happens. Melville Dalton's *Men Who Manage*, though produced in the fifties, is a gold mine of research detail. More recently and in Australia, Claire Williams has done *Open Cut*. Roy Kriegler's *Working for the Company* demonstrates the researcher getting the feel for the terrain, geographical and contested, and understanding its effects upon his respondents. There are numerous others. The point in mentioning them is not that they championed informal sources of data, but that they undertook complex projects where the ordinary chaos of a human life and the industrial structure in which it was set were scrutinised for what they would yield in terms of explanation of industrial society and the relationships within it. In doing so, they illustrate the creation of that most crucial of skills: the linking of research ideas to new ideas and further research.

If this then is the most crucial of research skills, how is it attained? James S. Coleman, writing about his work on adolescent society in USA (Coleman, 1961), attempted to answer this question by recounting the unfolding of his own intellectual development. Other researchers do the same. The best attempt I know to square the circle, to systematise the development of informal, creative thought for research purposes, is found in C.Wright Mills's *The Sociological Imagination*. In a brilliant Appendix 'On Intellectual Craftsmanship' (Mills, 1959: 195 *et seq.*), he exhorts his students to bind their life experience to their work. Experience, he insists, has not only a past but a future which is tapped into by the process of keeping a journal, a substantial file, of past work, present preoccupations and future projects. Herein are captured the 'fringe thoughts', the by-products of everyday living, which are fashioned in due course more systematically about the problems of your research. The keeping of the file is in itself the very stuff of intellectual production. He suggests we free up our imagination about the topics of the file and their relationships to each other by new arrangements of its contents from time to time, to reveal connections that were not at first obvious. Like Coleman, he begins his project with thinking and resists empirical research until it confirms some part of his first draft. He believes that we best survey the field when we know the universe, or, in other words, have thought the matter through. But how do the ideas come? He suggests that imagination in research stems from changing the perspectives of our thinking just as we rearrange the files. You need to site your research in its historical context and find comparisons against which to test it. Then you take your findings, gathered in the 'context of discovery', and explain them first to yourself and then to someone else to test them in 'the context of explanation'. The very fact of saying what you know plainly stimulates the imagination to further thought.

At the conclusion of his account of these techniques for stimulating thought, he returns to his most powerful and compelling theme, the very engine of the researcher's drive for quality in the craft.

> Know that many personal troubles cannot be solved merely as troubles, but must be understood in terms of public issues—and in terms of the problems of history making. Know that the human meaning of public issues must be revealed by relating them to personal troubles—and to the problems of the individual life. Know that the problems of social science, when adequately formulated, must include both troubles and issues, both biography and history, and the range of their intricate relations. Within that range the life of the individual and the making of societies occur; and within that range the sociological imagination has its chance to make a difference in the quality of human life in our time.
>
> (Mills, 1959: 226)

Perhaps our search for informal sources of data in Industrial Relations research may fall somewhat short of affecting the quality of life in our time, but at least one serious point can be made about it. The matters that we research impinge upon those issues that lie at the heart of the lives of most of our fellows, namely work and getting of it, paid and unpaid. It is a recipe for utter futility to exclude the skilled performances of these agents within the structures of industrial society from our discourse, or to reduce the human dimensions of our craft through rigid adherence to formal sources of information produced within narrowly defined disciplinary boundaries.

REFERENCES

Argyris, C. (1980) *Inner Contradictions of Rigorous Research*, Academic Press, New York.

Brenner, M. (ed.) (1980) *Social Method and Social Life*, Academic Press, New York.

Coleman, J.S., (1961) *The Adolescent Society: Social Life of the Teenager and its Impact on Education*, Free Press, New York.

Dalton, M. (1959) *Men Who Manage*, Wiley, New York.

Elden, M. *Sharing the Research Work*, Department of Labour and Industry, South Australia, No date.

Ferris, R. (1988) *Register of Industrial Relations Research Interests and Teaching Areas*, AIRAANZ.

Giddens, A. (1976) *New Rules of Sociological Method*, Hutchinson and Co., London.

Habenstein, R.W. (1970) *Pathways to Data*, Aldine Publishing, New York.

Hammond, P.E. (ed.) (1964) *Sociologists at Work*, Basic Books, New York.

Joseph, M. (1989) *Sociology for Business*, Polity Press, Oxford.

Kelly, J.R. and McGrath, J.E. (1988) *On Time and Method*, Sage Publications,

Newbury Park, California.
Kriegler, R. (1980) *Working for the Company*, Oxford University Press, Melbourne.
McCarthy, P. and Winter, M. (1988) *Teaching Industrial Relations Skills: Is it all Academic?*, Business Research Centre, Brisbane CAE, Brisbane.
Mills, C. Wright (1959) *The Sociological Imagination*, Oxford University Press, New York.
Moore, N. (1983) *How to Do Research*, The Library Association, London.
Riley, M.W. and Nelson, E.E. (1974) *Sociological Observation*, Basic Book Inc., New York.
Roethlisberger, F.J. and Dickson, W.J. (1970) *Management and the Worker*, Harvard University Press, 15th Printing, Cambridge, Mass.
Shipman, M. (1981) *The Limitations of Social Research,* 2nd Edition, Longmans, London.
Todd, A. (1972) *Finding Facts Fast*, William Morrow & Co Inc., New York.
Watkins, P. (1985) *Technology, the Economy and Education*, Deakin University Production Unit, Geelong, Vic.
Webb, E.J. et. al. (1981) *Unobtrusive Measures; Non reactive Research in the Social Sciences* (2nd Edition) Houghton Mifflin, Boston, Mass.
Williams, C. (1981) *Open Cut: The Working Class in an Australian Mining Town*, Allen and Unwin, Sydney.

9 Designing and Administering Questionnaires

Ron Callus

The advantages and disadvantages of using social surveys as a research method in Industrial Relations have been canvassed in other chapters in this monograph. The use of surveys in Industrial Relations can be expected to continue, as quantitative methods play an increasing role in the social sciences. It is true to say that there has been a tradition of survey use among Industrial Relations researchers both in Australia and in the UK. In part, this is because the subject continues to focus on institutional arrangements that disciplines such as economics or even sociology often ignore. As a result, the structures, practices and outcomes of Industrial Relations become sites of investigation and the survey method is one useful and structured method of collecting such information on a large scale. In other words, surveys can assist in understanding what is going on (descriptive research) and why it is going on (explanatory research) (deVaus, 1985: 11).

The purpose of this chapter is to examine some of the more practical issues involved in designing and administering questionnaires. Wherever possible, I have used examples gained from my involvement with the Australian Workplace Industrial Relations Survey (AWIRS). This was a national survey, conducted between November 1989 and May 1990, of over 2 300 workplaces with five or more employees, involving about 4 500 interviews with managers and union delegates in all industries except Agriculture and Defence (Callus, Morehead, Cully, Buchanan, 1991). This may help make some of the issues being discussed more meaningful to Industrial Relations researchers. It is assumed, however, that you have come to the conclusion that a sample survey is the most efficient and effective method of collecting data for the purposes of a particular project. In other words, the researcher wishes to be able to draw some conclusions about the population under study.

RESEARCH OBJECTIVES

Although during the course of research there are often unintended consequences, a research program should always begin with clearly defined objectives. The questionnaire design phase really begins with the formulation of the research proposal. In other words, what questions is the research trying to answer? Only then can you decide what information needs to be collected in order to answer the questions that have been posed. In AWIRS, the data collected had to answer two research objectives—What is the pattern of workplace industrial relations in Australia? and, What are the links between industrial relations structures and practices, and efficiency and equity outcomes?

The researcher needs to clarify how the information collected from the survey will be utilised. What will it describe or help explain? Unfortunately, there are too many examples of questionnaires that have been designed without sufficient attention to the likely uses of the data. In designing a questionnaire, the researcher should always have an eye on the output and its use. It is a worthwhile exercise to develop a mock-up of Tables that will be produced when the data becomes available and to see how these will be used in the analysis stage.

It is tempting to approach questionnaire design with the belief that if enough information is collected the data will somehow speak for itself, or at least suggest something interesting to a researcher with few ideas of their own. This 'dragnet' approach to social inquiry is inefficient, unjustifiable and gross empiricism at its worse. Data by itself is meaningless; it has to be given some meaning or context by the user. If the researcher has a clear idea of what it is they want to know, why they want to know it and how the data will be analysed, then the task of questionnaire design is made so much simpler.

It is also a common but erroneous view that because surveys are structured and standardised, the information collected is value-free and the researcher is merely engaged in a neutral technical task of determining the best form of question wording and layout. Irrespective of the quality and integrity of responses elicited from respondents, the design of the questionnaire instrument reflects the researcher's value system or implicit theoretical position. At the very least, the researcher makes a conscious decision to include some questions and not others. Why some questions are included and others are not is a combination of the researcher's assessment of the nature of the subject matter, the analytical framework being utilised in the research and a reflection of the researcher's own experiences.

It should also be said that while there are clear rules and guidelines on questionnaire design that are covered in detail in any number of textbooks on research methods 'quantitative research is invariably ... messy. It tends to involve false trails, blind alleys, serendipity and hunches to a much greater degree than the idealization implies.' (Bryman, 1988: 21)

The task of designing a questionnaire can be made more manageable if the

boundaries of inquiry are clarified. For instance, a survey of shop stewards many identify shop stewards as the unit of analysis, but this broad canvas gives no indication as to what we want to find out from or about shop stewards. However, confining the inquiry to a survey of workplace activities of shop stewards assists by indicating that some subject areas may be outside the scope of inquiry . In this case, the area for investigation suggests that it may be unnecessary to ask questions on some topics, such as the leisure-time activities of shop stewards.

Determining the boundaries will also assist with the process of identifying the unit of analysis and the sampling frame. The point of only surveying some members of the population (the sample) is that this is a more efficient and effective way of finding out information than having to interview the whole population. The sample being surveyed must be representative of the population being discussed or analysed. More importantly, the sample should ensure that conclusions about the population can be inferred with acceptable levels of confidence. The selection of a representative sample requires care and technical expertise, and researchers would be wise to seek professional help in designing their sample frame.

The unit of analysis is not only an important consideration for sampling purposes, but needs to be clarified to assist with questionnaire design. In AWIRS, the workplace was the unit of analysis about which respondents were asked to answer questions. However, in many cases, defining the boundaries of a particular workplace was problematic. It was necessary at the outset to explain to respondents the boundaries of the workplace and that questions about employees only referred to those working at or from the address that constituted the workplace. One problem encountered concerned respondents at workplaces that were also corporate head offices. These respondents invariably equated their workplace with the wider organisation that comprised a number of workplaces. In such cases, it was necessary to reinforce that the survey being conducted at the head office was only concerned about employees who worked at the nominated head-office workplace.

SOURCES OF INFORMATION

Before attempting to draft questions that will collect the required information, it is necessary to assess the availability and reliability of the information being sought. Having clear research objectives does not necessarily ensure that the information can be collected. For this reason, it is important that the questionnaire design phase is an iterative process. The sooner exploratory field work commences the quicker what's possible and practical can be determined. Time in the field discussing the subject matter to be covered by the questionnaires with those with knowledge of the issues is an essential part of survey design. In AWIRS, while there was a great deal of interest by various parties in labour productivity figures, it was clear from field work that there were methodological problems in devising meaningful measures. Where there were figures, it was not practical to collect these in any meaningful way that

would allow comparisons or even quantification of the data. Some information cannot be collected because it is unavailable, inaccessible or because the collection methods are inappropriate or not sophisticated enough. The quality of data collected from surveys is only as good as the source of the information. It is an important part of the design phase to assess if the information is available, if it is reliable and accessible. Researchers should never feel obligated to use the survey method if exploratory fieldwork suggests that the information could be better obtained through other methods.

In this way, questionnaire design is also closely linked to the choice of respondents, which may also have implications in designing the sample frame. In AWIRS, we found during field testing that it was much better to direct general questions about the organisation, product market and decision-making at the workplace to the general manager than to the manager, whose prime responsibility was industrial relations. A survey question will inevitably elicit a response; most people are reluctant to admit they don't know, but it is important to have confidence in that response by ensuring that the respondent has the information you are seeking. For example, how reliable are responses from corporate managers about workplace practices about which they have no day-to-day knowledge? These sort of questions are perhaps best directed to workplace managers.

Because surveys provide quantifiable data, there is often the illusion of precision, but it must be remembered that in practice, it is often not possible to collect precise figures on a range of issues. Once again, knowing the ways that the information will be used in analysis can help in deciding what level of precision or generality is acceptable. To calculate labour turnover rates, it was necessary in AWIRS to collect precise employment and employee resignation figures. In other cases, because the level of detail being sought is not easily accessible or there are costs in seeking the information, in terms of respondent cooperation, more general information may suffice. For instance, if you ask managers to give the percentage of employees under 20 years of age, few are likely to know the precise figure, but giving them the choice of quartile bands will facilitate their response.

This suggests that, somewhat paradoxically, it is necessary to be quite knowledgeable about respondents, even before the survey is undertaken. This is why it is often said that survey findings often never come as a real surprise to the researcher.

FROM CONCEPTS TO QUESTIONS

A survey questionnaire consists of a number of structured and standardised questions that follow a logical order. The questions either individually or in some combination constitute variables that are then utilised in data analysis. A question may itself be a variable, for example: How long have you been employed at this workplace? This is an independent variable for length of service. However, a derived dependent variable such as labour turnover may be

calculated, given the responses based on two different questions—employment numbers and resignations.

Concepts such as labour turnover often have to be operationalised into specific questions. Again, it is often left to the researcher to give some meaning or coherence to what may be otherwise quite abstract ideas. This is done by designing questions that individually or together can be used as measures or indicators of that concept. For example, a survey may seek to arrive at some measure of job satisfaction (the concept). This, however, requires the researcher to specify what the component parts of job satisfaction are and then to derive indicators such as the feeling of achievement. If feeling of achievement is one of the indicators of job satisfaction, it is then necessary to ask questions that will allow respondents' feeling of achievement to be assessed. The path from concept to questions can be a long and often frustrating one.

QUESTIONNAIRE FORMAT

Questionnaires can be designed to be self administered, that is filled out by (or the responsibility of) the respondent, or interview-based, where the respondent answers questions put to him/her during a personal interview. Ideally, trained interviewers should be used, but in practice, mainly because of budgetary constraints, researchers often have to administer the questionnaires. In such cases, it is useful to consult a standard text on survey methods that deals with interviewing techniques. In the case of AWIRS, we used a combination of interview and self-administered questionnaires. The self-administered questionnaires sought precise details that may have required reference to records or calculations. The interview-based survey involved trained interviewers administering structured questionnaires to respondents and coding or recording their responses. In either case, the questionnaires must be standardised so that all respondents that are asked a particular question are asked exactly the same question. Invariably, this can provide the researcher with quite a challenge. The question wording must be unambiguous, clear and understood in the same way by perhaps thousands of different respondents.

The fact that questionnaires used to quantify information are standardised does not necessarily mean that all respondents must be asked the same range of questions. Some questions need only be asked of respondents that gave particular responses to previous questions. Other questions may only be applicable to certain respondents or situations. For example, it is obviously meaningless to ask a series of questions on trade unions at the workplace at non-unionised workplaces. With the use of filter questions, (where the answer to a particular question determines which other questions will be asked), skip instructions (where some questions are skipped over by some respondents) and check questions (where the interviewer or respondents checks the answers to an earlier question to determine which questions to follow with), it is possible to make a standardised questionnaire quite adaptable to a range of different situations and respondents.

One important consideration in design is questionnaire length, or more particularly, how long it takes to complete. Questionnaires may seem quite short because they ask relatively few questions, but the responses might demand a great deal of work for the respondents, thereby making the questionnaire very time-consuming. A question on earnings for a particular occupation, for example, may require access to pay records and calculations to be done. There is no golden rule about the optimum length of a questionnaire. Much will depend on how it is administered, the subject matter, the competing time demands on the respondent, their interest in the subject, and levels of goodwill. In interview-based surveys, the skill of the interviewer may also be an important consideration. In AWIRS, the average time for the general manager questionnaire was 20 minutes. In contrast, we found that the questionnaire that was specifically on Industrial Relations generally took 90 minutes, with no adverse affects on response rates. But these were directed at managers with a real interest in the subject matter. Experienced interviewers often say that most people, when given the opportunity, enjoy talking about what they do or expressing their views. A real problem with lengthy questionnaires is the likelihood of respondent fatigue and, with that, an increased rise of error. As with all stages in questionnaire design, extensive testing in the field will determine the optimum or maximum questionnaire length.

Structuring a questionnaire so that the interview flows easily is particularly important. A well-designed survey can greatly assist in keeping the respondent interested. In the case of a self-administered questionnaire, effective layout is essential and can have a pronounced effect on completion rates. With interview-based surveys, quite complex question ordering can often be tolerated where interviewers are skilled and well-trained. For self-administered questionnaires, it is often worth the effort and expense of obtaining professional assistance with layout and graphic design, as it is a highly professional and expert skill.

QUESTION WORDING

Because all respondents answering a question are asked exactly the same question, it is important that the meaning of the question is unambiguous and clearly understood by all respondents in the same way. Particularly in Industrial Relations surveys, care needs to be taken with terminology. It is amazing how often terms that the 'experts' often understand and take for granted are not universally understood. In AWIRS, for example, not all managers responsible for industrial relations were specialists; they may have been store managers, bank managers or school principals, whose duties included responsibility for industrial relations at their workplace. These managers may not know what an award is, what over-award payments are or what labour productivity means. Similarly, there are many Industrial Relations terms that are specific to different situations or mean different things in different contexts. While 'shop steward' is generally regarded as the term for an employee who represents the union at the workplace, it is not a universal term. In some cases shop stewards are known as delegates or office representatives. Where there is any likelihood that the term used in the questionnaire may not be universally understood by respondents, it

should be clearly defined for them.

Questions should never be vague or ambiguous (How many employees took part in the last strike?—throughout the organisation, at this workplace, or in this section?), emotive (How much damage did the last strike cause?), or leading (Why did management cause the last strike?). Questions should specify the time period required, particularly when relying on people's memory. A question asking if any new technology has been introduced at the workplace will inevitably get a 'yes' response. Adding 'in the last year' may produce a different response. Questions that rely on people's memory are more likely to run the risk of producing inaccuracies and error, particularly if the issue is not an important one for the respondent.

RECORDING RESPONSES

In designing questionnaires, careful thought needs to be given to how the answers will be recorded and processed. As most questionnaires are processed by computer, codes mush be developed that allows the information to be efficiently and accurately entered.

Questions can be either closed or open-ended. Closed questions provide the possible responses and these are recorded by indicating the corresponding response code. An open-ended question provides for the respondent's own answers to be recorded in full. Closed questions allow the data to be easily processed because the responses are immediately coded. Respondents may be shown a list of possible responses and asked to nominate one or more of the choices presented, or the interviewer chooses the appropriate code on the basis of the answer received. In open-ended questions, the respondents answer in their own words and this appears verbatim on the questionnaire. Unless there is going to be some content analysis or transcript of response used for qualitative analysis, open-ended questions require coding after the interview, if the data is to be quantified.

Closed format questions are obviously easier for coding purposes and can be effectively used if there is an adequate list of alternative responses that can be coded. If the responses are likely to be varied or unpredictable, it is preferable to use open-ended questions.

The development of appropriate codes for use in closed questions requires extensive field testing to ensure that all possible responses are catered for in the coding frame. It is always wise to include an 'other' category in the coding frame (with details being written in). If the interviewer is unsure how to code the response and it is written in full under 'other', it can always be re-coded after the interview. In addition, it is important to allow in the coding frame for a 'not applicable' response and a 'don't know' code.

ENSURING RELIABILITY

At the very least, a questionnaire should go through two field tests. A pre-test will allow you to formally assess that questions are working as expected. Respondents should be debriefed by way of intensive questioning to see if they understood the meaning of questions and that the questions are not ambiguous, misleading or confusing. It is at this stage that appropriate coding frames can be constructed from open-ended questions. A further test—a pilot—needs to be undertaken to finalise filed procedures, interview or respondent instructions and administration. The pilot test is really the dress rehearsal for the questionnaire. As a general rule, questions should never be asked unless they have been fully tested.

There are a number of checks that can be built into questionnaires to ensure the reliability of the data. Follow-up questions can be used to check the accuracy of the response from previous questions. For example a 'yes' response to a question 'Is this workplace a member of an employer association?' can be followed by a question asking for the name of the employer association. It was found in AWIRS that some respondents incorrectly named their organisation's central office as their employer association. With these checks, errors can be corrected.

If the questionnaires are being data-entered for computer analysis, it is possible to develop programs that determine if the correct sequence of questions has been followed and that there is a logical consistency between different but related questions. Similarly, certain checks can be run on the accuracy of data entry by the use of edit and range checks. But the most reliable check on data is the use of an independent random audit of questionnaire responses by re-contacting respondents. Failing this, a manual check of all, or at least a random selection, of questionnaires for consistency is desirable. Where there are obvious errors, inconsistencies or queries, respondents should be re-contacted. While this is time-consuming and demanding, it is also worthwhile, as it adds to the reliability and authoritativeness of the survey.

Once the questionnaires have been returned, checked, open-ended questions coded or 'other' responses re-coded, the data entered and 'cleaned' to ensure it is consistent, reliable and accurate, the formidable task of data analysis can begin.

CHALLENGES FOR QUESTIONNAIRE DESIGNERS

There is an impressive literature on techniques for questionnaire design and if you are contemplating this method, you should consult one of the standard texts.

But the inherent limitations of this method continually present the real challenges for researchers utilising surveys. One such limitation, which is particularly frustrating for Industrial Relations research, is the difficulty of capturing the dynamics of social interaction and values through surveys. The more

sophisticated approach to these problems is a technique known as the Vignette. 'These are short stories about hypothetical characters in specified circumstances, to whose situation the interviewee is invited to respond.' (Finch, 1987,105) This technique is useful in that it allows the respondent to react to a social situation rather than to more abstract concepts. 'The respondent is being asked to make normative statements about a set of social circumstances rather situationally specific.' (Finch, 1987, 106)

With imagination and experimentation, there are possibilities of capturing some of the dynamics which it is often claimed can only be gleaned by observation or case study. The use of hypotheticals that put to the respondent a scenario to which he or she then responds has great possibilities. This method allows an insight into the processes, as well as the structures and outcomes. In AWIRS, hypotheticals were used to great advantage in assessing how workplace management reacted to changes in demand conditions and in judging the likely responses by employees to a management initiative at the workplace. But limitations remain and the real art of good research is to recognise both the limitations and possibilities of different methodologies and never to be a slave to any one method. The method should be the means to an end never an end in itself.

REFERENCES

Australian Bureau of Statistics (1990) *An Introduction to Sample Surveys.* Cat No. 1202.2.

Callus, R., Morehead, A., Cully, M. and Buchanan, J. (1991) *Industrial Relations at Work,* AGPS, Canberra.

Belson, W. (1981) *The Design and Understanding of Survey Questions,* Gower, London.

Bryman, A. (1988) *Quantity and Quality in Social Research,* Unwin Hyman, London.

de Vaus, D. A. (1985) *Surveys in Social Research,* Allen & Unwin, Sydney.

Finch, J. 'The Vignette Technique in Social Research', in *Sociology,* Vol 21, No 1 February 1987.

March, C. (1982) *The Survey Method,* Allen & Unwin, London.

Moser, C. and Carlton, G. (1980) *Survey Methods in Social Investigation,* Heinemann, London.

10 Interviewing, observation and ethnography: techniques and selection criteria*

Paul Sutcliffe

INTRODUCTION

This chapter considers a range of the more subjective or qualitative techniques and methods which are used in social research. Subjectivity refers here as much to the nature of the data to be collected—the attitudes and impressions of the research subjects—as to the techniques which are used to collect them—such as participant observation and interviews and discussions.

Reliance upon some of the more subjective or qualitative techniques is made more compelling by the fact that a significant proportion of industrial relationships involve interpersonal relations. Further, there tends to be a significant reliance upon a case-studies as a method of research in Industrial Relations and the techniques described here are those appropriate to case-study research. Why, then, should one not get the information directly from 'the horse's mouth', from those who are or who have been key players in the particular situation? Research into industrial disputes would seem to benefit, for example, from a discussion with those involved in its carriage and process. Similarly, by 'dirtying their hands', researchers who go into the workplace may come to better understand the context in which particular events occur.

On the other hand, the advantages of these techniques can often be more apparent than real. The practical and theoretical problems associated with such techniques often outweigh their utility—particularly when they are used

---

* Thanks to Margaret Gardner for helpful comments on a draft of this paper. This paper is for P.

inappropriately. Methodological questions can also be raised about excessive reliance upon the techniques. This chapter is therefore written from the perspective that the techniques described can be very useful in Industrial Relations, but that they need to be cautiously applied in practice.

THEORETICAL RATIONALE

The rationale for the utilisation of these techniques comes from two sociological traditions. The first, and most significant, is Weberian. For Weber, social analysis begins from the interpretation of 'social action and the subjective meanings and purposes attached to it.'[1] This means in effect that the analyst needs to understand behaviour in terms of those who take the action. This idea has been developed in two major ways. First, in the work of Berger and Luckman, social organisation is understood as a product or artifact of purposive human action—reality is said to be socially constructed. It is important, therefore, to study the construction process—the way in which the subjects' own beliefs and actions influence social behaviour and organisation.

A second way that the subjective 'action' idea has been developed—and this represents its most extreme form—is by the ethnomethodologists. This idea, sometimes described as the Social Action approach, is concerned like the Bergerian approach with 'accounting for the processes through which members construct their everyday life.'[2] But the idea is taken a step further in the respect that the researcher concentrates *only* upon the subject's own definitions and meanings in a situation. The research task becomes one of discovering the subject's own definitions and meanings. In other words, the researcher is warned against imposing any 'external' theoretical categories or constructs upon the group being studied. This explains why techniques like observation and interviewing are such important research tools for those who accept the rationale.

An alternative to both forms of actionalism is contained in marxist methodology and focuses upon the notion of a dialectic between 'structure' and 'consciousness'. The action approach implies that, since people create structures, it is the beliefs and attitudes of the people which are central to analysis of a situation. This view has been criticised on a number of grounds. Most importantly, it has been suggested that the structures and institutions which are created by purposive action become reified[3] and thus come to have the effect

---

1 Thompson, P. and McHugh, D. (1990) *Work Organisations*. Macmillan, London. p.35

2 *ibid.* p.34

3 In simple terms, and in the sense used here, reification refers to the process by which human control in social organisations comes to be displaced by the logic of the organisation. For example, a trade union is a collectivity of members and officials but the union can come to be seen as an entity in its own right with 'interests' over and above those of its membership. In this sense it becomes a structure which imposes itself upon the members and others.

of limiting or constraining subsequent purposive behaviour. It follows that the study of conscious action without attention to the relevant structural artifacts and elements of any situation is likely to lead, at best, to a partial analysis.

Advocates of a dialectical approach in Industrial Relations therefore talk of a need to focus upon the interaction of both 'structure' and 'consciousness'.[4] According to this view, it is not that the actors' own definitions and beliefs and attitudes are unimportant, rather that the researcher needs also to comprehend the other elements which constrain behaviour, in addition to the 'consciousness' elements. Looked at in this way, according to the dialectician, the social researcher can and should utilise the techniques with which we are concerned in this chapter, but not to the exclusion of other techniques or 'external categories'.

There is one other issue which is important in terms of the selection or utilisation of the various research techniques. This is the scientific tradition from which the research is approached. Two major schools of thought may be described; one is concerned with the acquisition of knowledge and the second is concerned with the development of understanding.[5] The former relies heavily upon the scientific method, positivism, and the application of strict formal techniques. The latter is less bound to 'scientism' or positivism and relies more upon a variety of techniques, including the more subjective and qualitative ones. By and large, Industrial Relations analysis has been more informed by the latter approach than by the former—at least in Britain and Australia.

The central methodological issue therefore centres upon the extent to which a piece of research relies upon subjectivist techniques. This is something which researchers will have to determine at the outset according to their own empirical and methodological preferences. Beyond this, questions can then be raised as to how well applied the various techniques are in any piece of research.

RANGE OF TECHNIQUES

The specific type of technique to be used will vary according to not only research purposes, but also the nature of the behaviour to be studied and the setting in which it takes place. Thus, for example, Galtung draws a distinction between non-verbal acts, oral-verbal acts, and written-verbal acts.[6] He then proposes that the type of technique which is used depends upon the setting in which data collection is to take place. Here he distinguishes between three types

---

4 See, for example, Hyman, R. (1984) *Strikes*. Fontana, London. 3rd.ed. pp.69-76

5 Markovic, M. (1972) 'The Problem of Reification and the Verstehen-Erklaren Controversy', in *Acta Sociologica* 15 (1). Also see Albrow, M. (1974) 'Dialectical and Categorical Paradigms of a Science of Society', in *Sociological Review*, 1974

6 Galtung, J. (1973) 'Data Collection', in Thompson, K. and Tunstall, J. (1973) *Sociological Perspectives*. Open University Press/Penguin, Harmondsworth. p.519. Verbal acts refer to those in which verbal symbols are used to communicate, for example, talking, as opposed to non-verbal acts, for example, shrugging.

of setting—informal, formal unstructured and formal structured.[7] These arrangements are summarised in the following table, which provides a guide, according to Galtung's formulation, to the context in which each of the various techniques are appropriate. Some of these techniques have been examined in an earlier chapter, for example, those relating to formal structured settings. This chapter will focus upon some of the remaining techniques.

SETTING	NON-VERBAL ACTS	ORAL-VERBAL ACTS	WRITTEN-VERBAL ACTS
informal settings	participant observation	conversations, use of informants	letters,articles, biographies
formal, unstructured settings	systematic observation	interviews, open-ended	questionnaire, open-ended
formal, structured settings	experimental techniques	interviews, precoded	questionnaires, structured

Three further distinctions are useful for understanding the choices which exist in regard to the selection of the various techniques. The first is whether the research is designed to elicit people's own meanings or in some way to quantitatively assess their behaviour—this relates to whether the research has a qualitative or quantitative focus. The second relates to the nature of the behaviour to be studied—the way it is conceptualised. The third is methodological and relates to the way in which the data is collected. These relationships are expressed in the following table.[8] Apart from illustrating the choices which a researcher has, this table indicates that these choices are also a product of the training of the researcher and of the assumptions which the researcher makes about 'science, people and the social world'.[9] To some extent, this argument is at odds with that contained in Chapter 4. There, it is suggested that such choices either do not need to be made prior to the research or are

7 'Informal' relates to an environment in which the researcher does not intervene to shape the research session and the behaviour which is examined is 'natural'. 'Formality' indicates some degree of intervention by the researcher in terms of the type of instrument being applied.

8 Minichiello, V., Aroni, R., Timewell, E. and Alexander, L. (1990) *In-Depth Interviewing*, Longman Cheshire, Melbourne. p.5

9 *ibid.* p.6

developed during the research program. Here, it is suggested that the methodological biases of the researcher may actually influence research design.

	Qualitative	Quantitative
Conceptual	• Concerned with understanding human behaviour from the informant's perspective	• Concerned with discovering facts about social phenomena
	• Assumes dynamic and negotiated reality	• Assumes a fixed and measurable reality
Methodological	• Data are collected through participant observation, un-structured interviews	• Data are collected through measuring things
	• Data are analysed by themes from descriptions by informants	• Data are analysed through numerical comparisons and statistical inferences
	• Data are reported in the language of the informant	• Data are reported through statistical analyses

OBSERVATION

In a formal sense, there are two main types of observational technique: participant and non-participant. In the former, the researcher takes part as a member of the group under observation. A study of shop-floor behaviour might entail the researcher getting employed as a co-worker of the group to be observed. In writing my thesis on shop committees in naval dockyards, I managed to secure a job as a boilermaker's offsider and was able to study work practices at Garden Island, as well as to attend shop-committee meetings. The 'understandings' resulting from this were one important element in helping to piece together the role and influence of the committees.[10] In the second case, the researcher observes the group but does not formally become part of it. The researcher may simply visit and record the behaviour—either being seen by the research group or sometimes being hidden from the group, for example, behind two-way mirrors. The distinction between the two approaches is not always clear, however, mainly because the level of participation is not always as

10 Sutcliffe, P. (1979) *The Development of Shop Committees in Australian Naval Dockyards*. Unpublished Thesis, University of Sydney.

intended or expected. In Industrial Relations research, observational research has typically been both non-participant and open.[11]

(a) Participant Observation

Generally, it takes a considerable length of time to set up and to observe as a participant. Most of the influential studies of this type have run for a year or more and have involved a substantial amount of preparation. This is to ensure that the observations include patterns of action rather than 'odd' incidents, and that those being observed support the process. One implication is that when participant observation is used the number of cases which can be considered is correspondingly limited. Lupton's study—which has been referred to—involved only two cases.

The culture of the subjects being observed and of the observer are also important. The method has been extensively used in anthropology where there is, more often than not, a difference between the observers and the observed. Whilst for most IR researchers this is not likely to be true—unless workers from two or more countries or ethnic groups are being compared—social differences between the observer and the observed may be as significant as cultural differences. It can be argued that someone who is not familiar with the working class, or part of it, may find greater difficulty in being accepted into a group, as well as in recording and interpreting the behaviour being observed.

The recording of observations will vary from cryptic notes of significant events or behaviours to extremely detailed case notes. Usually the greater the level of participation of the researcher, the less time they have for on-the-spot recording. Case notes must therefore be written up at a later stage. The detail of recording is important, however, not only for the subsequent analysis of the case but also for other researchers who may wish to replicate the study. Since one of the supposed major advantages of participant observation is to tap the situational richness of the subjects and of their work environment, and since the technique is costly in terms of research time, it is necessary that full records be kept for later analysis.

(b) Non-Participant Observation

As a non-participant observer, the researcher is much more of an outsider looking in on the subjects. This tends to raise questions about the researcher-subject relationship and the extent to which behaviour is likely to be modified by the presence of the observer. On the other hand, there is considerably more flexibility for movement within the research location than if one 'is working at the job' and there is considerably more time for full record-keeping and reporting.

---

11 There have, however, been some important studies of Industrial Relations behaviours which have been carried out by participant observation. One of the most notable was Lupton, T. (1963) *On the Shop Floor*. Pergamon, Oxford.

As mentioned, non-participant observation has been relatively common in IR research, if not as the sole technique, at least as one of the major techniques. The studies by Batstone, Boraston and Frenkel of shop-floor behaviour, for example, were based upon a considerable amount of non-participant observation.[12] In Australia, Kreigler's study, *Working for the Company*, is another example.[13]

(c) Problems

Some of the problems confronting the use of observation have already been raised. Apart from cost, there are six which need to be recognised as potential limitations of the technique. First, there may be ethical problems, for example, those associated with hidden observation. Does the researcher have a right to observe without the full knowledge and compliance of the subjects? Second, there may be problems of artificiality. If the subject(s) know that their behaviour is being observed, there is a likelihood that it will be modified. Consider, for example, a researcher who is interested in restrictive work practices. Concerns regarding who the observer is or who they represent might be expected to make the subjects at the very least suspicious and possibly hostile. Third, given that both verbal and non-verbal behaviour is observed, there is substantial potential for observer bias. The qualitative and subjective basis of observation is both its major attraction as a research tool and its major limitation. Fourth, there may be problems with inference. To the extent that observations are used to test hypotheses, there is considerable margin for error. Conversely, taking the ethnomethodologist's position that observation techniques should be used to find out and generate hypotheses rather than to impose existing categories, there is a considerable margin for error given the small number of cases generally involved. Fifth, building upon the latter point, replication of observation-based studies is difficult, especially given the passage of time. Finally, there is the problem of lack of control in the scientific sense of the word. The researcher is more or less forced to accept the entire situation without the possibility of any systematic variation of the conditions under which the observed behaviour is occurring.

Taken together, these may raise doubts about the reliability and validity of the techniques both as a form of research and in relation to the data which is collected. Yet most of the problems can be limited in various ways. For example, the likelihood that subjects will be resistant or will modify their behaviour may both be controlled by the way in which the research is set up. If, for example, the project is explained to a work-group and they see that the researcher is 'independent' from management, they may be more likely to act 'normally'. Similarly, observer biases can be controlled through full non-interpretive reporting.[14] Nevertheless, reliance upon observation as the sole

---

12 See, for example, Batstone, E., Boraston, I. and Frenkel, S. (1978) *The Social Organisation of Strikes*. Basil Blackwell, Oxford.

13 Kreigler, R. (1980) *Working for the Company*. Oxford University Press, Melbourne.

14 By this is meant that the reporting should, as far as possible, contain a faithful record of what was said by the subjects and not the interpretation of the researcher. The nearer you can get to a full transcript the better are the records.

research technique has limitations and it is usually prudent to supplement observations with one or more other forms of data collection. Generally, some form of questioning is desirable and the use of such techniques can be a means of reducing 'error' in observations.

INTERVIEWS

Margaret Stacey suggests 'some behaviour is difficult to observe because it takes place in private. There are circumstances which it is quicker to ask about, when the answers seem likely to be reliable, than it would be to observe. People's beliefs and attitudes may be important and interesting to know, but they cannot be seen, because they are not behaviour, and they are rarely written down, so that they cannot be found in documents.'[15] This both comments upon the problems of observational techniques and suggests why various forms of questioning are desirable. Pre-coded interviews and structured questionnaires have been looked at in an earlier chapter. Here, we will focus upon: conversations with informants, and open-ended interviews and questionnaires.

Which particular technique is used will depend, in part, on the stage of research program. Thus, for example, conversations and very open-ended interviews are both common and useful in the early stages of research or at the piloting stage. The information received can be used in helping to formulate or develop hypotheses which can be tested later, or more commonly, to suggest research directions which had not been anticipated by the researcher. Serendipity should not be underestimated as a research instrument![16] Prior to developing a survey instrument to examine employment relations in small business, Jim Kitay and I spent a considerable amount of time talking to a number of employers in some of the industries with which we were concerned. Many of the issues which we subsequently examined in the survey were suggested to us as a result of these conversations. Further, the conversations were a rich source of 'quotes' and a valuable means by which we came to understand some of the problems being experienced by small business employers and employees.

The techniques also tend to be more useful in some types of research than in others, for example, historical research. Conversations with Jack Lang were undoubtedly useful to some of the researchers concerned with industrial relations in NSW under Lang Labor.[17] Whether Lang's opinion or memory would constitute a 'test' on some issue or theory is not, however, so clear. Similarly, a conversation with one shop steward may be of little use as a basis for formulating a survey of shop stewards in general. There are, therefore, limits to the utility of the techniques, but carefully used they can be valuable research tools.

---

15 Stacey, M. (1969) *Methods of Social Research.* Pergamon, London. p.70

16 Kitay, J. and Sutcliffe, P. (1989) 'Employers and Employment Relations in Small Business in Australia', in Bray, M. and Kelly, D. (eds) *Issues and Trends in Australasian Industrial Relations*, AIRAANZ.

17 Radi, H. and Spearritt, P. (1977) (eds) *Jack Lang*, Hale & Iremonger, Sydney.

More formal interviews can be either structured or unstructured. A highly structured pre-coded interview tends to be an instrument used in hypothesis testing and is more useful in the acquisition of definitive data than attitudinal forms. Unstructured interviews tend to be particularly useful for:

1 The development of ideas for analysis;
2 Eliciting new information;
3 Assessing attitudes, or
4 When you are not sure what the appropriate response categories are.

From my own experience, the success of an interview or questionnaire is, at least in part, dependent upon the care which is given to the formulation of the questions. The more structured the interview, the more true this becomes. Considerable thought and attention needs to be given to the framing of the questions, the language used, and to the intention implicit in each question.

The major disadvantage of unstructured interviews, however, is that they tend to yield large quantities of data and responses which are difficult to compare and classify. It is conceivable, for example, that 100 respondents may each give an apparently different response to the same question! There are a number of other important issues and practical problems which confront those using interview techniques—particularly unstructured instruments.

First, as Stacey points out, the interviewer is a supplicant. They are seeking information for their own purposes and interests and the respondent may perceive little advantage for themselves in assisting. Among other things, this means that the quality of the responses can depend in part on the extent to which the respondent supports the questioning, and this may not always be apparent. This in turn emphasises the need to go about gaining support for the interview from the outset. This may be affected in several ways. If the respondents are members of a union, by gaining the support of the officials of that union for the research, it may satisfy any suspicions which the respondents have. Similarly, to ask the respondent for their help is important, as is gaining their confidence in various ways. Also, the language of the questions must be able to be understood by the respondents. With respect to interviewing, one can talk meaningfully about the 'managed accomplishment of getting in'.[18] But getting in is only part of the exercise, the interviewer also needs to maintain rapport throughout the process and this can depend on a number of things—for example, the length of the interview, whether some of the questions are threatening to the respondent, and so on. Guarantees of confidentiality are often also important to respondents.

---

18 This draws on an idea that people whose 'faces fit' are more likely to get recruited. See, for example, Silverman, D. and Jones, J. 'Getting In', in Child, J. (1973) *Man and Organisation*, Allen & Unwin, London, Chapter 3. In our own research on small businesses, we found that employers were far more likely to talk to us when they found not only that our study was supported by the relevant Employers' Association, but also that one of the researchers was a small business operator.

Unstructured interviews are not always easy to record. The interviewer has the dual role of questioner and reporter. Since it is important for the interviewer to maintain direct contact with the respondent (for example, eye contact[19]), the two roles do not always mix. Yet to rely upon memory to report is simply not good enough. An hour-long interview transcribes to twenty or more pages of text. As with observation, the quality of the research will often depend on the extent to which the behaviour is faithfully recorded. There are two main ways to resolve this problem, and both are expensive. One is to have two people involved in the interview process—reporter and interviewer—which makes for useful comparisons of impressions. The second is to use a tape-recorder or video-recorder for the interviews. Some respondents simply do not feel comfortable with this approach (whether they make it clear to the interviewer or not), and there is a very large cost involved in transcribing text as well.

Apart from these types of practical or operational problems, interviews are subject to the same types of methodological problems as observational techniques: ethics (will you be honest about the purposes of the survey or about confidentiality and can you afford to be, without biasing the responses?), artificiality (will the respondent modify their responses for some reason?), observer bias (in an unstructured interview, there is a mass of verbal and non-verbal data which can be misinterpreted),and finally, would another interviewer elicit the same responses to the same questions?—that is, is the study able to be accurately replicated?

CONCLUSION

It can be concluded that the qualitative techniques which have been briefly discussed in this chapter can be useful in Industrial Relations research both in their own right, and more particularly, when used in conjunction with other techniques. The proviso is that the applications need to be used with caution and considerable attention to detail. The book of readings by Cochrane which has been cited contains 28 chapters, each of which is concerned with sources of error and bias in qualitative techniques. The student who intends using these techniques needs to be counselled and cautioned about the risks associated with them. On the other hand, they can be a source of fascinating and important detail and can add substantially to the understanding of the situation and behaviour which is being examined.

In this chapter, some of the problems of qualitative techniques have been emphasised. It needs to be pointed out, however, that some of the most interesting research findings in Industrial Relations, and some of the most insightful work, have been those derived from applications of these techniques. It is imperative that IR researchers do 'dirty their hands', get on to the shop floor, and talk to the participants and soak up the 'atmosphere'. This adds

---

19 Argyle, M. and Dean, J. 'Eye-contact, Distance and Affiliation', in Cochrane, R. (ed) (1973) *Advances in Social Research*, Constable, London, Chapter 1. The remainder of this book examines a whole range of error sources relating to interviewing.

immeasurably to the satisfaction of working in our field. Finally, there have been too many studies of IR, particularly those carried out within the sociological tradition, which demonstrate that the researchers have never experienced the practical relationships of IR, and their studies show weaknesses as a result.

REFERENCES

Albrow, M. (1974) 'Dialectical and Categorical Paradigms of a Science of Society', in *Sociological Review.*

Batstone, E., Boraston, I. and Frenkel, S. (1978) *The Social Organisation of Strikes*, Basil Blackwell, Oxford.

Bechhofer, F. (1974) 'Current Approaches to Empirical Research: some central ideas', in Rex, J. (ed) *Approaches to Sociology*, Routledge & Kegan Paul, London.

Chalmers, A. (1982) *What is this Thing Called Science?* Open University Press, Milton Keynes.

Cochrane, R. (ed) (1973) *Advances in Social Research*, Constable, London.

Galtung, J. (1973) 'Data Collection', in Thompson, K. and Tunstall, J. (eds) *Sociological Perspectives*, Penguin, Harmondsworth.

Hyman, R. (1984) 3rd.ed., *Strikes*, Fontana, London.

Kitay, J. and Sutcliffe, P. (1989) 'Employers and Employment Relations in Small Business in Australia', in Bray, M. and Kelly, D. (eds), *Issues and Trends in Australasian Industrial Relations*, AIRAANZ.

Kreigler, R. (1980) *Working for the Company*, Oxford University Press, Melbourne.

Lupton, T. (1963) *On the Shop Floor,* Pergamon, Oxford.

Markovic, M. (1972) 'The Problem of Reification and the Verstehen-Erklaren Controversy', in *Acta Sociologica*, 15 (1).

Minichiello, V., Aroni, R., Timewell, E. and Alexander, L. (1990) *In-Depth Interviewing*, Longman Cheshire, Melbourne.

Radi, H. and Spearritt, P. (1977) (eds) *Jack Lang*, Hale & Iremonger, Sydney.

Silverman, D. and Jones, J. 'Getting In', in Child, J. (1973) *Man and Organisation*, Allen & Unwin, London.

Simon, J. (1969) *Basic Research Methods in Social Science,* Random House, New York.

Stacey, M. (1969) *Methods of Social Research*, Pergamon, London.

Sutcliffe, P (1979) *The Development of Shop Committees in Australian Naval Dockyards*. Unpublished Thesis, University of Sydney.

Thompson, P. & McHugh, D. (1990) *Work Organisations*, Macmillan, London.

11 An Introduction to Descriptive Statistics

Nadia Verrucci

Potentially, statistics can greatly enhance your research project. The extent to which statistics can be an integral component of your project will depend on your understanding of the use of statistics. It is too often the case that you become thoroughly engrossed in your research task and give insufficient thought to the use of statistics.

This chapter will stimulate you to consider the scope for the use of statistics in your project. It is important that any researcher understand the methods by which the information collected may be best analysed and presented.

WHAT IS STATISTICS?

Statistics is a body of methods used to assemble, describe and analyse numerical data which relates to aspects of social life. Statistical work focuses on a numerical representation of social life, on things that can be counted, measured or quantified.

The methods of statistics can be divided into two categories, descriptive and inferential.

Inferential statistics

This method of statistics are used to infer the characteristics of a population from observations made from a sample of the population. A majority of social research is based on inferential statistics, as the study of a large population is much more difficult and expensive.

Descriptive statistics

As the name implies, this method of statistics involves methods for describing social phenomena and providing numerical description of the groups being discussed. The description may take a variety of forms, ranging from tables, charts, to the use of pie-charts.

It is the use of basic descriptive statistics that will be focused on in this chapter; further extension on Statistical Methods will be examined in Chapter 12.

SOURCES OF DESCRIPTIVE STATISTICS

There is an endless array of sources for statistics. A very quick browse through any of the introductory textbooks dealing with Industrial Relations—for example, Deery and Plowman (1991)—will quickly alert you to the variety of sources of statistics which would be not only useful but imperative for the completion of a successful research project. It is possible to divide the potential sources of statistics into two groups: Formal Data, Self-Generated Data.

Self-Generated Data

This would involve the development and organisation of questionnaires which would allow you to develop your own set of data. Whilst this process can be a very rewarding experience, developing your own data to supplement your research project can be fraught with difficulties. Chapters 9 and 10 provide important insights into the skills required if you are considering using this procedure.

Formal Data

Even if they do develop Self-Generated Data, the majority of projects will also make use of Formal Data. There is an enormous array of sources for this data. The Australian Bureau of Statistics (ABS) is a federal government department which publishes an endless variety of statistics, ranging from various labour market indicators to the Annual Publication of National Income and Outlay Accounts, which provides a breakdown of the income and outlays of the nation. The ABS is also responsible for the development, distribution and collation of the Australian Census, which is conducted every five years. The Census provides valuable information to policymakers and researchers on a wide range of issues relating to the Australian population. It can be considered as a five-year stocktake of the size, composition and distribution of the Australian population. The information from the Australian Census is readily available to the public and it provides information dating back to the early 1900s.

There is a variety of other government departments which regularly publish formal data. For example, the Treasury, the Reserve Bank of Australia, and the Department of Industrial Relations. In addition to these domestic data sources, there are also overseas publications from the International Monetary Fund (IMF) and the Organisation for Economic Co-operation and Development (OECD).

When using formal data, you should be very careful in your interpretation of it. It is always a good idea to develop a checklist before deciding to use any particular data:

1. Ensure that you understand the method of collation, and what the fine print means, if any exists, as this could greatly influence the results of your work.

2. If you are dealing with labour market indicators, such as unemployment rates, ensure that you know if the data is seasonally adjusted or unadjusted. This will be very important if you are making long-term comparisons. For example, seasonally adjusted unemployment rates have been manipulated or adjusted to compensate for the extreme variations that are anticipated by the statisticians within certain periods of the year.

3. If you plan to examine data over a long period ensure that you are using data that either comes from the one data source or, if from a variety of sources, that it is possible to directly compare them.

It is important to remember that potentially, due to the endless array of sources for data, it is possible to find data to support almost anything you may want to discuss. The question that you have to continually ask yourself is: how reliable is my data source? Perhaps you have happened across an interesting data set from a very small sample study by an independent research group; it is important, if the sample set is very small and if the process of collation is not evident, that you do not assume that it is foolproof. It would be extremely damaging to build your research project around a data set that is fraught with potential difficulties which could place a question mark over the accuracy of its conclusions. Never assume, just because the statistics have been printed, that they are accurate.

Presentation of Results

Having arrived at the source of your statistics, you will then have to decide what portion of the information you wish to use and how you will display the statistics.

The method of display is extremely important. A well-constructed research report, with well organised and well presented statistics, greatly enhances your final research report.

a) Tables

The most basic method of displaying statistics is by constructing a table of your observations. Tables serve the dual function of presenting your research results and also organising data for statistical analysis. Tables appearing in a report should be numbered sequentially to avoid ambiguity in referring to the tables in the text. If a report consists of several chapters, tables are often referenced with

two numbers, such as 1.1, 1.2 and 2.1. The first number identifies the chapter and the second, the number of the table within the chapter.

All tables should be given a brief but descriptive title. The title should provide the reader with a clear understanding of what the table is about, without being too lengthy. Tables that appear within the body of the report, as compared to tables in the appendix, are there to provide a summary of total observations. It is important not to attempt to display too much information on the one table. Tables which attempt to display too much information quickly become more confusing than helpful.

The objective of using statistics is to support your argument or document your story. To assist in making the table meaningful, it is most often required that you do not present only the raw data. It is often helpful to display the observations relative to some standard. Three relative measures commonly used are ratios, proportions and percentages. Each measure provides for a different interpretation of the observations.

Ratios

Ratios can be very useful as they allow for the relative comparison of very different measures. For example, you can calculate the ratio of academics to students, ratio of cars to individuals, the ratio of unionists on a worksite to non-unionists. The ratio of two values is one value divided by the other. For example, the ratio of unionists at workplace A to non-unionists at workplace A is equal to:

$$\frac{\text{Number of Unionists at Workplace A}}{\text{Number of Non-Unionists at Workplace A}}$$

If you have a sample of 60 people in a workplace and 40 are unionist and 20 are not, the ratio is
40/20 = 2:1. Another method of describing this would be to say for every two unionists there is one non-unionised employee at the workplace. The use of ratios allows discussion to be made of the observations in a different way.

A proportion

A proportion is a special ratio that is a subset of observations relative to the total set of observations. Alternatively, it can be considered as a part divided by a whole.

$$\frac{\text{Part}}{\text{Whole}} = \text{Proportion}$$

This is in contrast to a ratio, which can be considered as a part divided by a part.

Thus, continuing with the previous example of the 60 employees in the workplace, what proportion of the employees are unionised?

$$\frac{40}{40+20} = \frac{40}{60} = .67$$

The proportion of non-unionists of the 60 employees would be:

$$\frac{40}{40+20} = \frac{20}{60} = 0.33$$

Percentages

The last relative measure is that of percentages. A percentage is simply a proportion multiplied by 100. In 1986, the percentage of Australia's population who were Aboriginals was 1.42%. This was arrived at in the following method.

Based on ABS Census figures from the 1986 Census, the Australian Aboriginal population was 227 645, the total Australian population was 16 018 350. To establish the percentage of the Australian population made up of the Aboriginal population involves the following calculation:

$$\frac{227\ 645}{16\ 018\ 350} = 1.42\%$$

This allows discussion to focus very quickly on the extent to which the Australian Aboriginal population is a minority group within the total Australian population. Whilst the numbers alone did provide the same information, the use of percentages can provide a very efficient method of highlighting particular trends that you wish to emphasise.

Percentages are generally rounded to one decimal point. However, caution must be used when applying proportions or percentages to small samples of observations. If dealing with less than 50 observations and if using proportions or percentages, it is a good idea to also report the actual numbers on which the figures are based. Proportions and percentages transform the frequencies of samples of different sizes to a standard form which can more easily be compared.

b) Graphical Display of Statistics

Graphical display of statistics provides an alternative method of presenting information.

There is a wide variety of methods that can be used to display statistics. This section will review some of the most often used forms of graphical display. Before discussion begins on the alternative forms of graphical display, it is important to note that headings for the graphics are very important. In the presentation of any graphical display, care needs to be taken with the overall title and setting out of the display. It is just as important as the title and display of tables, as discussed in the previous section. Discussion will focus on:

Frequency Histograms
Frequency Polygons
Pie Charts

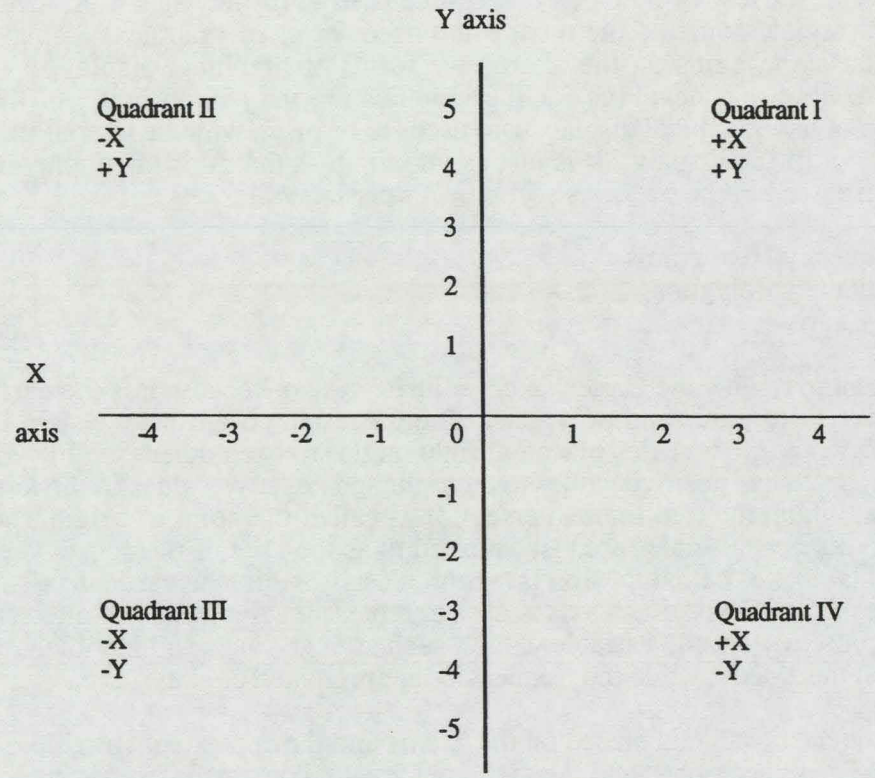
It is important to review the Cartesian co-ordinate system because it is the basis for frequency histograms and polygons. The Cartesian co-ordinate system is made up of two number scales placed at right angles to each other (see Fig 1). The number scale has positive values to the right and negative values to the left. The point at which the two lines intersect, 0, is called the point of origin.The vertical and horizontal scales are also referred to as the axes of the coordinate. The horizontal axis is called the abscissa or the X axis, while the vertical axis is the ordinate of the Y axis. Each axis is used to represent a dimension of interest. In graphic presentation, the variable values, such as years, ages and income, are presented on the X axis, while the frequencies are presented on the Y axis.

The independent variable is placed on the X axis and the dependent variable on the Y axis. The upper right-hand quadrant, quadrant I, contains instances where both X and Y are positive; quadrant II contains instances where there are negative X values and positive Y values; quadrant III represents negative values for both X and Y; and quadrant IV displays positive X values and negative Y values.The scales commonly used in social research take on positive values, and therefore quadrant I is most often used.

Frequency Histogram

This is a term used for a simple vertical bar chart. Bar graphs are very effective when you wish to compare items, as opposed to changes, over time. To compare several related series, you can display them side-by-side or overlap them. Figure 2 compares data relating to the occupations of Queensland Aboriginal males with Queensland total males. They can either display the actual number of observations or, as in the case of the graph shown, a relative frequency—percentages. By placing the two series side-by-side, it makes it very easy to compare the occupations of the Queensland Aboriginals and the Queensland total males.

Figure 1: Cartesian Coordinate System



Frequency Polygon

A frequency polygon is very similar to a histogram. It is also referred to as a line graph. The difference is in appearance, as the axes are identical. Instead of using bars to represent the frequencies, in each interval a line joining the midpoints of the interval is used. This particular type of graph is very useful in comparing numerical information over time. For example, Figure 3 displays the participation rates within the Australian labour force for males and females over the period 1967 to 1990. It is important not to attempt to use too many series of information on the one frequency polygon, as it can become very confusing and this defeats the purpose of ensuring a clear presentation of data.

Figure 2: Aboriginal males by occupation, Queensland, 1981.

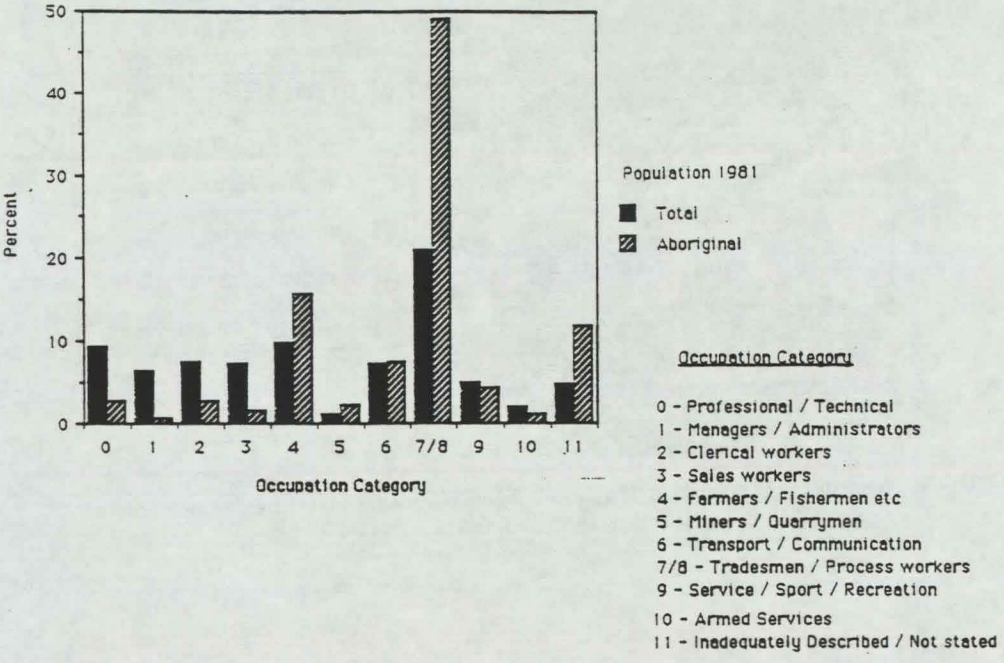


Figure 3: Participation rates by sex, 1967-90.

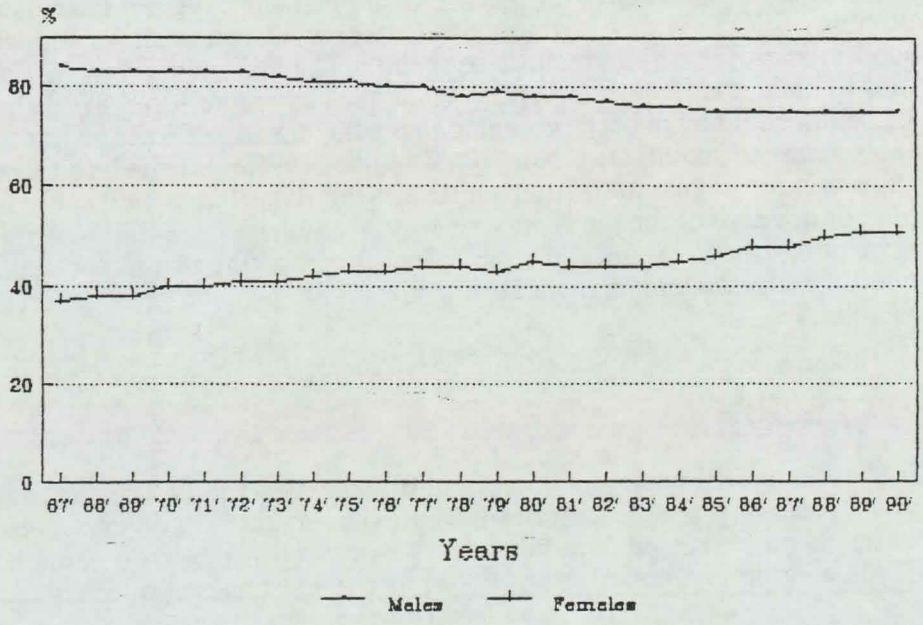
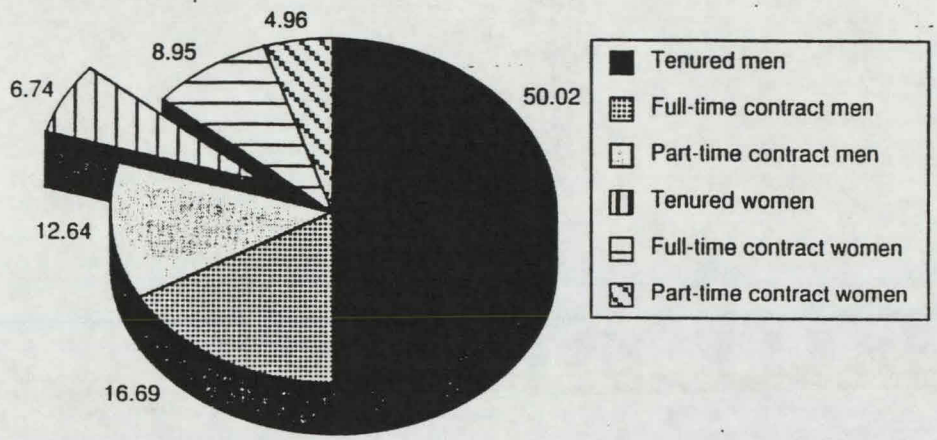


Figure 4: Male and female university academics by tenure, 1987



SOURCE: Department of Education, Employment and Training, Universities Annual Statistical Collection, 1987 (Forms 213 & 214).

Pie Charts

Pie charts are another alternative for data presentation. A pie chart consists of a circle that is divided proportionally to the number of cases in each category of a scale. The chart is constructed by dividing the degrees of a circle (360) into the proportions representing the categories. A full circle contains 360 degrees and since percentages are based on parts per 100, one per cent is equal to 3.6 degrees, 10 per cent equals 36 degrees, and so on. The degrees in a circle can be accurately determined with the use of a protractor. A pie chart is drawn beginning with the largest segment at the twelve o'clock position and winding around clockwise to the smallest segment. The example given in Figure 4 relates to male and female university academics by tenure for 1987. While this information could have been presented in a table, the use of a pie chart takes the readers attention much more quickly. The use of different shading techniques for the various segments further enhances the data that is being used. The cutting of a wedge of the pie is another way of emphasising a particular piece of information. In this instance, the pie chart is highlighting that the percentage of tenured female academics is much lower than the percentage of tenured male academics.

CONCLUSION

This chapter has discussed the important role that descriptive statistics can play in your research project. Descriptive statistical methods are very diversified; what has been discussed here has been a summary of the various methods of collation and presentation of data. The objective in using descriptive statistics is

to enhance your research project. Adequate presentation of your statistics is an important component of this and therefore a great deal of time has been devoted to the examination of alternative forms of presentation.

Overall, what this chapter has achieved has been to direct your attention to the issue of descriptive statistics and to encourage you to consider the various sources for data and how best to use the information available.

FURTHER READING

Barton, R. (1988) *Understanding Social Statistics*, Curtin University of Technology/Allen & Unwin, Sydney. An excellent book of basic statistics which was designed as a self-instruction guide. Preface is titled 'On the Fear and Dread of Statistics'.

Burns, R.M. (1990) *Introduction to Research Methods in Education*, Longman Cheshire, Melbourne. Covers quantitative methods more than qualitative methods. Includes questions for self-testing of current understanding at each step.

Clark, A.W. (1983) *Social Science: Introduction to Theory and Method*, Prentice-Hall, Sydney. An introductory text with exercises. Part 2 (well over a third of the book) deals with statistical techniques.

Kurtz, N.R. (1983) *Introduction to Social Statistics*, McGraw-Hill, Tokyo. Covers a range of descriptive and analytical statistical methods. Each chapter has a glossary of key terms, symbols and formulae, as well as exercises, with answers.

Lewis, D., O'Brien, D. and Thampapillai, D. (1990) *Statistics for Business and Economics*, HBJ, Sydney. The objective of this book is to assist students in developing and improving their knowledge of statistics. It includes questions that can be used for self-testing.

12 Statistical Methods*

Keith Whitfield

STATISTICAL METHODS IN INDUSTRIAL RELATIONS RESEARCH

There is a widely held belief that Industrial Relations research is not very quantitative and that Industrial Relations researchers are largely innumerate wordsmiths. A scrutiny of the Industrial Relations literature would reveal that this is not an accurate assessment and that it is becoming less accurate with time. For example, a review of major Industrial Relations journals in Australia, Britain and the United States between 1985 and 1989 revealed that approximately one third of articles contained some statistical material and/or simple statistical analysis and the same proportion used a form of multivariate statistical method.[1]

It would be true to say that Industrial Relations researchers have shown less interest in using statistical methods than their counterparts in cognate disciplines, especially economists and psychologists.[2] A major reason for this is that Industrial Relations deals with issues which cannot be readily analysed in

---

* The author would like to thank Paul Marginson, Mick Silver and David Williams for helpful comments on an earlier draft of this chapter.

1 The precise breakdown was: No Statistics—34 per cent; Use of Simple Statistics and/or Univariate Methods—33 per cent; Use of Multivariate Methods—34 per cent. The journals were the *Journal of Industrial Relations*, the *British Journal of Industrial Relations* and *Industrial Relations*. The last exhibited the highest statistical content with 55 per cent of articles using multivariate methods; the equivalent figures for the others were *JIR* (14 per cent) and *BJIR* (26 per cent). A more comprehensive survey is currently being undertaken and will be reported elsewhere.

2 This is reflected in the fact that most of the disciplines which are cognate to IR have their own sub-disciplines which focus on statistical issues, such as econometrics, psychometrics and sociometrics. Maybe there is a need to develop irometrics. This term has, to my knowledge, only been used once, by members of the Sydney IR department, and only then in jest!

quantitative terms, such as the legal status of trade unions. However, even where a quantitative analysis is feasible, Industrial Relations researchers have generally been loath to pursue such an approach. This seems to be largely a result of the difficulty in developing adequate quantitative proxies for the key concepts of Industrial Relations theory. Many areas of Industrial Relations are predominantly concerned with qualitative phenomena and institutional structures which do not lend themselves to the continuities much-beloved of statistical analysts.

The amount of quantitative research in Industrial Relations and its level of sophistication are, however, increasing. A number of reasons can be postulated for this change. Firstly, recent years have seen the development of a number of statistical techniques which are more appropriate for examining the qualitative and discrete phenomena of Industrial Relations research. Prime examples are linear discriminant analysis, probit and logit analysis (see Section 5). Secondly, there has been a major increase in the range of quantitative data available for Industrial Relations research. In Australia, the Australian Workplace Industrial Relations Survey (AWIRS) will significantly increase this trend and will consequently promote an increased interest in quantitative methods among Industrial Relations researchers. Thirdly, researchers in disciplines cognate with Industrial Relations, especially economists, have taken a greater interest in topics in the Industrial Relations area and have frequently used the quantitative methods which are common in their subject-areas.

Statistical methods have been used in two main ways by social scientists. The first involves the simple analysis of data to illustrate a point that is being made in the text. For example, it might be stated that approximately forty per cent of full-time employees are members of trade unions. Such an approach can be termed *statistical description*. Alternatively, statistical methods can be used to test a particular hypothesis. This requires a much higher level of technical sophistication and draws heavily on the theory of statistical inference. For example, an early debate in the Industrial Relations literature concerned the degree to which the growth of unionism was caused by economic or political factors. More recent research has tested this hypothesis by relating union membership growth to a range of economic and political factors using multivariate regression analysis (see, for example, Bain and Elsheikh, 1976). Using statistical techniques in this manner is typically termed *inferential statistics*. It is principally concerned with the attempt to generalise from given samples of observations to whole populations. Many Industrial Relations studies contain both types of statistical analysis and very few contain neither. It is therefore important to know the range of statistical methods which are available and where they should be used.

The principal objective of this chapter is to outline the main statistical methods which could be used as part of an Industrial Relations research programme. Given space limitations, it is inevitably superficial and at most presents a menu of choice for researchers. Consequently, interested readers will be guided to other sources if they wish to pursue a particular method in more depth. An attempt is also made to indicate the appropriateness of particular methods for

Industrial Relations research and the key projects which have used them. Thus, this chapter should be seen as a brief introduction to a vast literature, that is, the small step that might commence a thousand-mile march.

The chapter begins by outlining some general issues about the use of statistical methods in social science research and proceeds to examine statistical techniques which require only simple calculation, such as measures of central tendency and dispersion. Thereafter, it offers an overview of techniques which involve much more complex computation, such as the various multivariate methods which are increasingly deployed in Industrial Relations. The latter require the use of some form of computer and a statistical package. Those most used by Industrial Relations researchers are outlined at the end of this chapter. These techniques represent a small sub-set of the possibilities open to the potential quantitative researcher. A Glossary of Statistical Terms can be found in the Appendix.

GENERAL ISSUES

Statistical methods represent an attempt to develop a more rigorous base for the development of our understanding of how the real world operates. They allow us to highlight empirical regularities which may prove to be the basis of new theoretical insights and to test the accuracy of existing theories. Their use does, however, raise a number of issues concerning the validity of the data used, the analysis of qualitative information and the possibility that political bias might be inherent in quantitative analysis.

Social scientists currently deploy a large battery of statistical methods, some of which are extremely sophisticated. However, these methods yield meaningful results only if the data on which they are based is valid. In short, this is a prime example of the computing adage 'Garbage In, Garbage Out'. It is, therefore, important to use data which are appropriate for the task at hand and are as free from potential bias as possible. This involves either the collection of information via the best practice methods, as outlined elsewhere in this volume, or the undertaking of a series of validity checks to ascertain whether the secondary sources being used attain the appropriate standards. Some attempt should also be made to check whether the quantitative variables being used to proxy the real-world phenomena under analysis are appropriate. The lack of a relationship between variables in an analysis may reflect inadequate data rather than the absence of an association in the real world. More importantly, the reverse may also apply.

A distinction is frequently made between quantitative and qualitative information and it is often assumed that the latter is of little use to the would-be statistical methodologist. The distinction is generally taken to mean the difference between a variable with characteristics which vary by degree (for example, by size, age or level) and those which vary by kind (such as gender or occupation). The distinction between them is not, however, rigid and many qualitative variables can be used in statistical analysis; for example, gender is often included as an explanatory variable in quantitative analyses as a dichotomous (or dummy)

variable, occupations can be analysed in terms of their pay or social status (such as the Hope-Goldthorpe scale). Moreover, quantitative and qualitative information can often be used in tandem to offer a more comprehensive treatment of a given phenomenon. Therefore, to see the two types of information as substitutes is a major mistake.

Some social scientists have criticised what they perceive as the conventional wisdom on the analysis of social statistics, namely that it is more objective and rigorous than more qualitative approaches. This oft-stated view is often associated with a position that both the statistics and the methods used have an inherent political bias, which thereby biases the conclusions which are drawn. There is much to be said for this viewpoint, as there is frequently an air about statistical analyses which suggests a degree of objectivity well beyond the bounds of possibility for a social science. However, the position can be over-stated. In particular, it can be used to dismiss the use of statistical methods entirely and thereby throw away a key weapon in the armoury of the social scientist. A more logical response is to confront the problem of potential bias by examining the social context in which the statistics used have been generated and use a variety of methods based on differing underlying assumptions. The key issues in this debate are outlined in Irvine *et al.* (1979).

SIMPLE STATISTICAL TECHNIQUES

A wide range of readily calculable techniques exist which can be used to summarise the characteristics of a body of data. These are generally termed descriptive statistics and encompass frequency distributions, measures of central tendency and measures of dispersion. Not only are they of importance in their own right, but they are also the foundation of most other statistical techniques which social scientists use.

The construction of *frequency distributions* represents one of the most effective techniques for organising and exhibiting a body of statistical data. A frequency distribution shows the number or proportion of a given variable that fall within a particular class. It can be exhibited in the form of a frequency table or a frequency graph. For example, Table 1 shows a listing of industrial stoppages according to their length. This can be converted into a frequency table (Table 2), once a number of class limits are specified. The same information can also be exhibited as a frequency graph (Figure 1). This graph is known as a bar chart and is generally used where the classes are discrete, that is, not a continuous series. It is also possible to plot the distribution in the form of a frequency polygon (Figure 2) by joining the mid-points of each class. Note that the nature of the distribution depends crucially on the class-limits chosen. Those used here are arbitrary and hence the distribution is arbitrary. Less arbitrary limits would be equal limits or those based on an equi-proportional scale as a logarithmic scale.

Figure 1: Frequency Graph

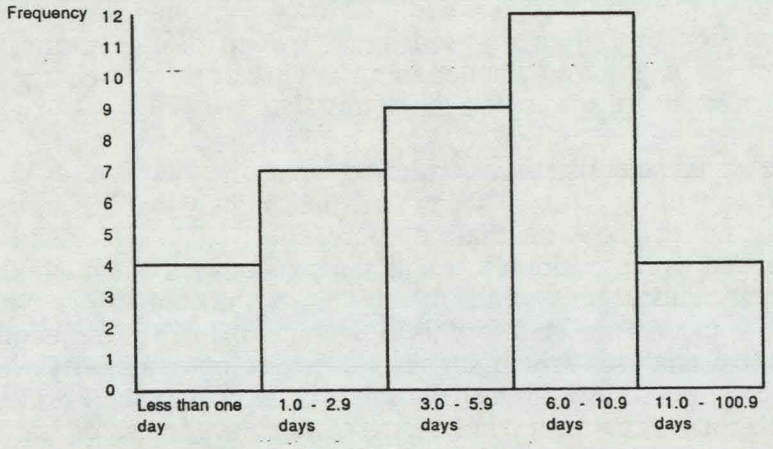


Figure 2: Frequency Polygon

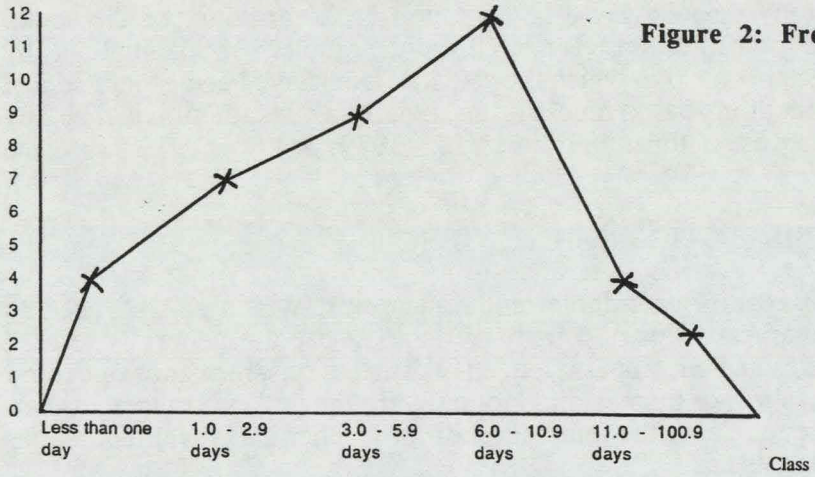


Figure 3: Measures of Skewness

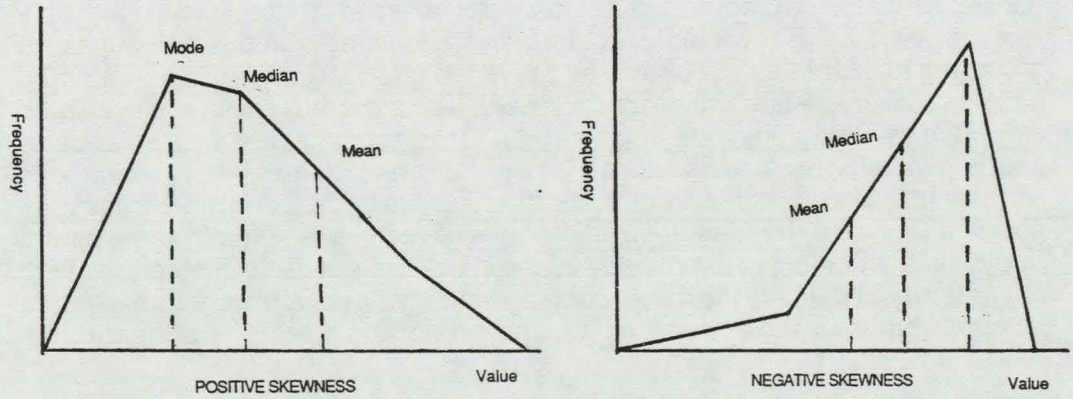


Table 1: List of Industrial Stoppages by Length

3.5, 7.5, 0.3, 50, 4.0, 7.8, 1.5, 110.0, 7.0, 8.5, 1.0, 4.0, 8.0, 90.0, 5.0, 4.5, 2.0, 365.0, 3.5, 10.0, 8.5, 6.6, 0.5, 1.0, 6.0, 0.3, 8.0, 12.5, 3.0, 10.0, 4.0, 0.5, 8.5, 2.0, 4.5, 7.5, 1.0, 55.0.

Table 2: Frequency Table of Length of Industrial Stoppages

Class (Length of Stoppage)	Frequency (Number of Stoppages)
Less than 1 day	4
1.0—2.9 days	7
3.0—5.9 days	9
6.0—10.9 days	12
11.0—100.9 days	4
101 days or more	2
TOTAL	38

For certain purposes, it is necessary to present the frequency information in a slightly different way. A prime example is where we wish to compare distributions of different sizes. To do this, we construct *relative frequency distributions* which convert distributions into percentages. An example is shown in Table 3. Another alternative is to construct *cumulative frequency distributions* which show the number or proportion of cases below a certain point (see Table 4).

Measures of central tendency are commonly referred to as averages, although some use this term to refer to one measure of central tendency—the arithmetic mean. The four most frequently used measures are the arithmetic mean, the median, the mode and the geometric mean.

The arithmetic mean corresponds most closely to what the layperson would regard as the average. For ungrouped data, it is calculated by adding the values of all of the observations of a variable together and dividing by the total number of observations. Thus if we had the following values—5, 7, 9, 7, 6, 5, 3—the arithmetic mean is 42/7 or 6.

The median represents the value of the middle observation of a series of

observations. It is calculated by listing the observations in rank order according to their values and determining the value of the observation which is at the halfway point. Thus, given the above group of values, the rank order is 3, 5, 5, 6, 7, 7, 9 and the median is 6.

Table 3: Relative Frequency Distribution of Strike Length

Class (Length of Stoppage)	Relative Frequency (Percentage of Stoppages)
Less than 1 day	11
1.0—2.9 days	18
3.0—5.9 days	24
6.0—10.9 days	32
11.0—100.9 days	11
101 days or more	5
TOTAL	101 (Subject to rounding error)

Table 4: Cumulative Frequency Distribution of Strike Length

Class (Length of Stoppage)	Cumulative Frequency (Number of Stoppages)
Less than 1 day	4
Less than 3 days	11
Less than 6 days	20
Less than 11 days	32
Less than 101 days	36
TOTAL	38

The mode is the most commonly occurring observation. It is calculated by making a frequency distribution of the values of the observations and determining which has the highest frequency density. Some distributions may have more than one mode and will therefore be termed multi-modal. The modal class of the distribution shown in the example on the length of stoppages above is 6.9 - 10 days and the distribution is uni-modal.

The geometric mean is typically used when calculating rates of growth. It is used because the arithmetic mean in this situation exaggerates the 'average' rate of growth. Instead of adding all observations and dividing by their number, the observations are multiplied and the root equal to their number is taken. The main advantage of the geometric mean is that it takes account of the problem of compound growth. Thus, if we have a series which is growing through time, each year's growth is based on a higher base figure. The arithmetic mean takes no account of this, but the geometric mean does. For example, if the annual percentage change in a variable is 250, 134, 66, the arithmetic mean increase is 150 per cent per annum. The geometric mean is 130.3. Thus 250 x 134 x 66 is 2 211 000 and the third root of that is 130.27.

The arithmetic mean, the median and the mode will all give the same result if they are calculated from a symmetrical distribution. However, if the underlying distribution is positively skewed (a longer tail to the right of the 'average'), the mean will be higher than the median, which will in turn be higher than the mode. The reverse applies for negatively skewed distributions. This is demonstrated in Figure 3. Indeed, a measure of skewness is based on the difference between the mean and the median, as the former is affected by extreme values and the latter is not. The concept of skewness is important in Industrial Relations because a number of key Industrial Relations variables, such as personal income, are typically skewed.

The arithmetic mean is used by social scientists unless there are good reasons to do otherwise. This largely reflects the fact that it possesses important mathematical properties which form the basis of much statistical methodology. Its disadvantages (and hence replacement by one of the other measures) result from a number of factors. Firstly, it is particularly sensitive to extreme values and this may be critical if the underlying distribution is skewed. The median is not so affected and would therefore be used instead (unless, of course, the purpose of the measure was to reflect the effects of the extreme values). Secondly, the mean cannot be calculated directly if the underlying frequency distribution has open-ended classes, for example, of the form '500 and above'. In this situation, researchers either make an assumption about the mean of the open-ended class or use the median. Thirdly, there are some occasions when the mode is a more useful statistic than either the arithmetic mean or the median. This is when it is more important to know where the peak of a distribution occurs rather than its 'average' or 'middle'. For example, a key issue might be when the peak level of strikes occurred. However, when the data available are only in the form of a frequency distribution (for example, income bands) the interpretation of the mode is problematic.

Whereas measures of central tendency relate to the 'average' value of a distribution, *measures of dispersion* relate to the spread around the 'average'. This is important because the reliability of a given 'average' depends crucially on the degree to which the other values cluster around it or not. For example, we would be more confident about stating an 'average' length of strike if most strikes were of approximately the same length than if there was a very wide range.

There are two main types of measures of dispersion—those which relate to the arithmetic mean and those which relate to the median. The former include the mean deviation, the standard deviation, the variance and the coefficient of variation; the latter include the quartile deviation and the range. The most important is the standard deviation because of its extensive use in statistical theory.

The mean deviation is the sum of the deviations of the values of a distribution from its arithmetic mean, divided by the number of observations. In this calculation, the signs of the deviations are ignored. Thus, the mean deviation for our original group of observations (5, 7, 9, 7, 6, 5, 3) is 1.5. The variance squares each deviation around the mean and divides the result by the number of observations. In the example, this is 3. If we take the square root of the variance, we obtain the standard deviation. In the example, this is 1.7. The coefficient of variation is typically used for the comparison of the dispersion of one variable relative to another, particularly where they are based on differing scales. It is calculated as 100 times the standard deviation, divided by the sample mean. Thus, if we had another set of observations for our hypothetical sample of 10, 24, 32, 15, 10, 5, 2, we could compare their dispersions by estimating their coefficients of variation. In this case, it is 170/6 or 28.3 for the original sample and 987/14 or 70.5 for the new sample. This technique is used in Creigh (1980).

The quartile deviation is based on similar principles to the median. Whereas the median is the middle observation of a rank order of values of a group of observations, the lower quartile is the value at the one-quarter point and the upper quartile is the value at the three-quarters point. The quartile deviation is the value at the upper quartile minus the value at the lower quartile, divided by 2. In the example above, this is 7 minus 5 divided by 2, that is, 1. The range is the difference between the lowest and highest values in the series. In the example, the range is 6.

The reasons for using one measure of dispersion rather than any other are similar to those for using its associated 'average'. In general, the standard deviation and variance are the most appropriate because of their associated statistical properties. However, where extreme values (or outliers) have a major effect on the measure, the quartile deviation may be more appropriate.

SIMPLE CORRELATION

A great deal of social science research involves analysis of relationships between phenomena. For instance, Industrial Relations researchers have been concerned, *inter alia,* with the relationships between the nature of the wage-fixation system and the number/length of industrial disputes, union membership and earnings and different measures of industrial disputation. Such analyses implicitly involve some concept of correlation and could be examined via an appropriate correlation technique. This not only allows the researcher to examine an additional dimension, but also permits the testing of specific hypotheses about relationships between Industrial Relations variables.

Correlation techniques take a variety of forms. The most frequently used by social scientists are those which build on the method of least squares and the associated regression analysis. The *method of least squares* essentially represents a technique which is more rigorous than 'eyeballing' to draw the best-fitting straight line between observations on two variables. Given a scatter of points as in Figure 4a, the method of least squares plots the line which equalises the deviations above and below the line and minimises the sum of squared deviations, as in Figure 4b. This is seen to mirror the technique of a person fitting the best line by drawing. This is often termed the regression of variable y (say, number of strikes) on variable x (say, the level of unemployment).

Figure 4a: Scatter Diagram

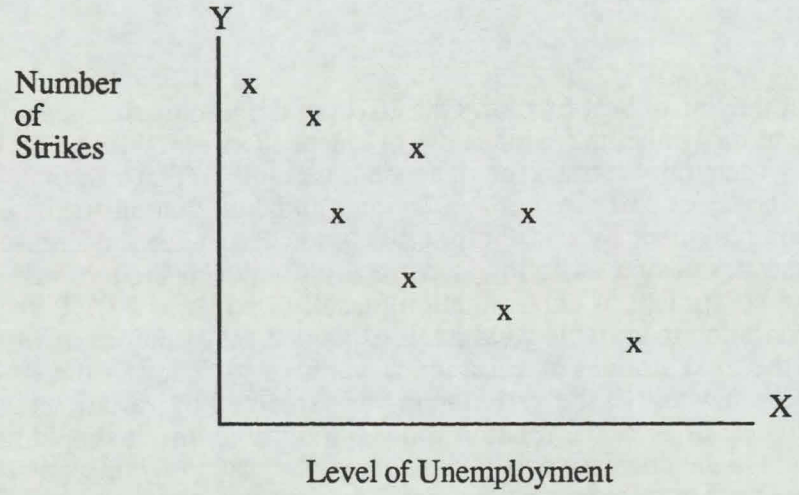
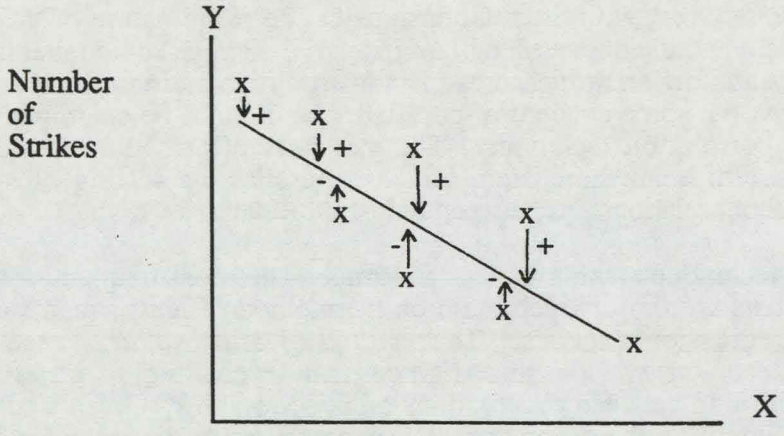


Figure 4b: Method of Least Squares



Method of Least Squares

$$\Sigma + = \Sigma -$$

$$\left[\Sigma (+)^2 + \Sigma (-)^2\right] \text{ minimised}$$

The slope of the line of best fit shows the effect of a one-unit change in variable x (generally termed either the explanatory or independent variable) on the change in variable y (generally termed the dependent variable). Thus, in the example mentioned above, a coefficient of -.001 would indicate that an increase in the level of unemployment by one thousand is associated with a decrease in the number of strikes of one. The linear correlation between the two variables is given by the coefficient of determination (usually known as R^2). It shows the amount of variation in variable y, which is explained by variations in variable x, divided by the total amount of variation in variable y. Thus, if the R^2 takes a value of one, the whole of the variation in y is explained by variations in x and, if it takes a value of zero, the relationship is purely random. It should be noted that this refers to the linear association and it may be that a low linear association may reflect a high non-linear association. The square root of the coefficient of determination is the Pearsonian coefficient of correlation (often termed R for obvious reasons), a statistic that is sometimes used in social science research.

The simple regression model with one dependent variable and one independent variable is rarely used in research as most researchers prefer to use the multivariate version. Two papers have, however, used the former—Tarantelli

(1986) and Robinson (1988). The multivariate model is outline in Section 4.

The simple linear model is based on a number of strong assumptions about the underlying distributions of its variables, that is, it is parametric. In particular, it is based on the assumptions that the underlying distributions are normal (symmetrical and bell-shaped) and that they represent cardinal rankings (each unit-interval is of equal value). In many situations, these assumptions are not appropriate and it is better to use techniques which do not depend on them—non-parametric methods.

There are many types of *non-parametric method,* many of which are extremely complicated, but we shall mention only two—Spearman's coefficient of rank correlation and Kendall's coefficient of concordance. Spearman's coefficient (R_S) measures the degree of association between two sets of observations which are listed on an ordinal rather than a cardinal scale. Kendall's coefficient allows us to extend this to more than two sets. For instance, we might want to relate the rank order of countries according to differing measures of strike incidence.

Spearman's coefficient involves subtracting the rank orders of the two series from each other, adding each of these together and multiplying the result by 6 and then dividing this total by the product of the number of observations and the square of the number of observations minus 1. The resulting statistic (R_S) will take a value between +1 (perfect positive association) and -1 (perfect negative association). A figure of 0 indicates no association. It is interpreted in the same way as the 'R' above, being in fact derived from it for use with variables measured on an ordinal scale.

An example using Spearman's coefficient is shown below. Table 5 is based on a ranking of countries according to the number of working days lost due to industrial disputation per thousand employees and the number of disputes per one hundred thousand employees between 1962 and 1981. It might be of interest to know how closely correlated these two measures are. The calculation of Spearman's coefficient requires that the rank orders are subtracted from each other, the results squared and then summed. In this example, this yields 9 + 25 + 16 + 4 + 4 + .25 + 25 + 0 + 0 + 12.25, which equals 95.5. Putting this into the Spearman formula produces the following calculation: 1 - 6 X 95.5 / 10 x (100 - 1). This equals +.42, indicating a positive, but far from perfect correlation, between the two indicators of disputation.

The calculation of Kendall's coefficient is more complicated. The numerator is 12 multiplied by the square of the difference between the sum of the rank orders for a given group and the total sum of rank orders divided by the number of groups. The denominator is composed of the product of the square of the number of sets of observations, the number of observations and the square of the number of observations minus one. The final figure takes a value between 0 (no association) and 1 (perfect association).

Table 5: Ranking of Countries by Measure of Stoppage Activity, 1962-81

Country	Working Days Lost Due to Industrial Disputation per 1000 employees		Stoppages per 100 000	
	Number	Rank Order	Number	Rank Order
Australia	497	7	45	10
Canada	765	9	10	4
France	195	3	18	7
Irish Republic	695	8	17	6
Italy	1347	10	26	8
Japan	113	2	6	2=
New Zealand	205	4	27	9
Sweden	91	1	2	1
United Kingdom	386	5	11	5
United States	474	6	6	2=

Source: Creigh (1986, Table 2.2)

This can also be illustrated using an example on dispute incidence. Table 6 shows information on the number of working days lost due to industrial disputation for five countries for four different sub-periods. Kendall's coefficient can be used to ascertain the correlation between the rank-orders for different years. This requires summation of the ranks for the different years and the summation of these sums. This yields 60. Divided by the number of countries, this yields a mean of 12 for each country and allows us to calculate the square deviations from their mean value. The deviations are: +6, -4, -7, +1, +4. Squaring and then summing these yields 118. This gives us all of the information which we need to calculate the coefficient. Putting it into the Kendall formula yields: 12 x 118 / 16 x 5 x 24. This yields +0.74. Given that the Kendall coefficient takes values of between 0 and 1, this suggests a strong correlation between rank-orders.

Table 6: Working Days Lost Due to Disputation, 1962-1981

Country	Working Days Lost Due to Industrial Disputation per 100 employees							
	1962-66		1967-71		1972-76		1977-81	
	No.	Rank	No.	Rank	No.	Rank	No.	Rank
Australia	203	4	421	4	749	5	615	5
France	198	3	202	2	236	2	146	1
New Zealand	77	1	184	1	205	1	354	2
United Kingdom	131	2	347	3	491	4	576	4
United States	358	5	715	5	445	3	378	3

Source: Creigh (1986, Table 2.3).

MULTIPLE REGRESSION ANALYSIS

The simple linear regression model represents a useful technique for examining the nature and strength of the relationship between two variables. An assumption implicit in its use, however, is that variations in the dependent variable can be largely explained in terms of variations in a single independent variable. Given the complexity of Industrial Relations relationships, this is rarely the case. For instance, the earnings of a sample of workers are likely to depend on a large number of factors, of which membership of a union will be one. Thus, if we are to estimate the 'pure' effect of union membership on earnings, it is necessary to include all potential influences as independent variables.

Multiple regression analysis is simply the development of the simple regression model to cover the case of more than one independent variable. It attempts to estimate the line of best fit between an independent variable and a dependent variable, holding the relationships between the other independent variables and the dependent variable constant. The main results of the analysis can be interpreted in much the same way as in the simple case—the coefficients on the independent variables showing the slope of the line of best fit and the R^2 showing the amount of variations in the independent variable, which can be explained by variations in the independent variables. Multiple regression additionally involves a number of elements that are not present in a simple regression and these are best explained by the use of an example.

Bain and Elsheikh (1976) attempted to develop an econometric model of the growth of union membership in Australia between 1907 and 1969. They defined their dependent variable as 100 times actual union membership divided by

potential union membership. This was regressed on independent variables relating to the change in prices (ΔP_t), the change in wages (ΔW_t), the level of unemployment (U_t), the density of union membership in the preceding period (D_{t-1}) and a variable attempting to capture the effect of the introduction of compulsory arbitration on union membership (C_t). The resulting regression equation is shown in Table 7.

Table 7: Multiple Regression Equation of Union Membership Change in Australia, 1907-1969

Estimated Coefficients Constant	ΔP_t	ΔW_t	U_t	ΔU_t	D_{t-1}	C_t
12.5455	0.0287	0.2551	-0.3214	-0.044	-0.2097	6.4157
(4.3700)	(0.3309)	(2.5422)	(-2.8672)	(-3.8284)	(-3.9277)	(3.5468)

Summary Statistics

R2 = 0.7423 F-Statistic = 30.9300

Source: Bain and Elsheikh (1976), Table 5.3.

The key feature of this table is the series of coefficient estimates for each of the variables. This shows the estimated linear relationship between the independent variable concerned and the dependent variable, holding all other relationships constant. For example, the figure of -0.3214 on the unemployment variable suggests that a one-unit increase in unemployment will produce a .3214 unit decrease in union membership. Similarly, the compulsory arbitration variable suggests that the introduction of arbitration caused an increase in the growth of union membership of approximately six percentage points.

Each of the coefficient estimates is associated with a 't' value, which is usually listed below the estimate in brackets. It indicates the confidence which we can place in the coefficient estimate. It derives from the statistical theory of hypothesis testing and, as a rough rule of thumb, we say that the coefficient is significantly different from zero, if it is greater than or equal to 2. Thus, in Bain in Elsheikh's equation, all of the coefficients are significant except that for the price variable.

The overall explanatory power of the equation is shown by the R^2 and the significance by the F-statistic. The R^2 indicates that 74 per cent of the variation in the dependent variable is explained by variations in the independent. The F-statistic indicates whether the independent variables have any influence on the dependent. In general, the higher the F-statistic the greater the influence. An F-

statistic of 30.9 for such an equation is extremely high and we can be sure that there is a significant relationship.

Multiple regression analysis has been used considerably by Industrial Relations researchers and represents a useful technique for analysing complex relationships. Examples of its use in the analysis of Industrial Relations issues are Chapman and Mulvey (1986), Nowak (1988), Ng and McCallum (1989) and Deery and Purcell (1989).

The multiple regression model does, however, have severe limitations and these are particularly problematic for Industrial Relations research. One of the most important of these is that it tends to focus analysis on a narrow range of variables which have the characteristics which are most appropriate for the technique. These are variables which are continuous or semi-continuous (such as earnings or unemployment), rather than either dichotomous (gender or membership or not of a given organisation) or polychotomous (ethnic origin or shades of opinion). Given that economic variables tend to be more continuous than social and political, it can be suggested that testing between hypotheses by multiple regression biases the analysis towards accepting an economic approach.

DISCRETE REGRESSION MODELS

Regression analysis based on ordinary least squares is not as appropriate in those situations when the dependent variable is discrete, that is, either dichotomous or polychotomous. This is most common in those situations where we are examining qualitative choice. For example, we might be concerned with the reasons why some workers join a union and others do not (binary choice) or why workers vote for or against industrial action or abstain (multiple choice). Such models are extremely common in Industrial Relations research.

Qualitative choice models relate the choice made by individuals between two or more alternatives to information about the individual. The resulting equation can then be used to predict how other individuals will behave when faced with the same situation. Such models are built on many of the same foundations as the ordinary least squares model, particularly that the relationships between the dependent and independent variables are linear but involve additional assumptions about the nature of the decision made by the individual.

There are two main types of discrete regression models. The first is very similar to the multiple regression model and includes the linear probability model and linear discriminant analysis. A second type uses non-linear estimation methods based on the principles of maximum likelihood estimation and includes the probit and logit models.

The *linear probability model* is simply the extension of the multiple regression model to the case of a binary dependent variable. The estimated equation shows the probability that a given outcome will occur if particular values of the

underlying variables occur. Examples of studies which have used this model are Bain and Elias (1985) and Lintner (1987). Its major drawback is that predicted values of the dependent variable can lie outside the range (0,1). There are also severe estimation problems with using this technique.

A closely related technique which has been much used by social science researchers is *linear discriminant analysis*. It is based on an attempt to predict whether any particular observation should be allocated to one group or another (others). The key principle behind this is the estimation of a linear discrimination function which estimates the coefficients for each background characteristic of a given sample, such that the within-group variance of the function is maximised relative to the between-group variance. It yields coefficient estimates which are identical to the linear probability model, but with a different constant term. The midpoint between the mean values of the dependent variable is used to classify observations between the two groups. The ability of the function to classify the original observations between the two is often used as a measure of goodness of fit. This has been used by Deaton and Beaumont (1980), Hiltrop (1985) and Verma (1989) to examine Industrial Relations issues.

Probit and logit analysis are more satisfactory techniques for estimating qualitative choice models. They are based on the estimation of the determinants of a 'latent' variable which is assume to underlie the observed distribution of outcomes between various categories. For example, if we have observations indicating whether individuals are union members or not, and on the background characteristics of persons who are in either situation, probit and logit analysis can be used to estimate the factors which are associated with high and low values of the propensity to join a union. The resulting index is the latent variable which produces the observed distribution between members and non-members.

The main difference between probit and logit analysis relates to the transformation of the underlying index into the choice made. In the probit model, this is based on the cumulative normal probability function (and it therefore might be more appropriately named the normit model), and in the logit model, it is based on the cumulative logistic probability function.

The output of probit and logit analyses is not as easy to interpret as that of multiple regression. The coefficients on the probit model are best interpreted relative to each other, rather than as absolutes. This is a consequence of the transformation undertaken in the probit estimation. A useful technique which is often used is to estimate the expected probability for a base individual and then vary each factor one at a time. A similar problem is inherent in the logit model. It estimates the odds that a particular choice will be made. The probability can only be estimated at a given point on the probability function. The mean of the probability of the dependent variable is usually chosen.

An example is a study of the employment situation of a cohort of young persons in Britain in February 1987 (Whitfield and Bourlakis, 1991). A probit analysis which related whether or not an individual was in employment at this time to a

vector of independent variables derived the results shown in Table 8. It indicates that this depends on a number of factors, including the person's ethnic background, physical well-being, marital status, family background, whether or not he/she participated on the Youth Training Scheme (YTS) and, most strongly, the unemployment rate in the local labour market. Interpretation of these results is facilitated by the setting-up of a base individual of particular characteristics. On this base, it is possible to vary one factor at a time and see the effect of this on the probability of employment. This is shown in Table 9.

Table 8: Probability of Employment in February 1987

List of Variables	Coefficients	t-ratios
Constant	1.3065	(7.156)
YTS Participant	0.1811	(2.552)
Minority Ethnic	-0.6421	(-3.963)
Local Unemployment Rate	-0.0597	(-8.271)
Gender	-0.0506	(-0.808)
Disability	-0.4440	(-2.647)
Owner Occupied Home	0.1867	(2.608)
No. of Siblings	-0.0474	(2.235)
Single	0.4340	(3.240)
Non-manual Father	0.0134	(0.188)
No. of 'O' Levels	0.0241	(1.865)

Table 9: Estimated Probabilities

Probability of Employment	
BASE	0.83
YTS participant	0.87
Local Unemployment Rate of 4.5 per cent (minimum)	0.93
Local Unemployment Rate of 27.7 per cent (maximum)	0.54
8 'O' levels	0.87
0 'O' levels	0.70
Ethnic minority member	0.61
Disability	0.69
Owner Occupies Home	0.87
No Siblings	0.85
Married	0.69

Note: The BASE individual is non-ethnic, lives in an area in which the unemployment rate is 13.5 per cent (mean), is not disabled, does not live in an owner-occupied home, has 2 siblings, is single and has 4 'O' levels.

Examples of the use of probit in Industrial Relations research are Cappelli and Sherer (1989), Frenkel and Weakliem (1989), Keefe and Katz (1989) and Heywood (1990). The logit technique has been used by Bradbury *et al.* (1986), Crockett and Hall (1987) and Payne (1989).

SUGGESTIONS FOR FURTHER READING

The objective of this chapter has been to outline some of the main statistical techniques which Industrial Relations researchers either do or might use. Given the severe space limitations, it has only been possible to give a brief overview. Those interested in pursuing these techniques further are therefore advised to examine the following sources:

1. M.J. Moroney (1978) *Facts from Figures*. Harmondsworth, Penguin. An armchair introduction to statistical analysis.

2. W.J. Reichmann (1978) *Use and Abuse of Statistics*. Harmondsworth, Penguin. A very readable and sceptical approach to the subject matter of this chapter.

3. H.M. Blalock (1979) *Social Statistics*. New York, McGraw Hill. A good overview of the sociological perspective on statistical methods.

4. G.S. Maddala (1988) *Introduction to Econometrics*. New York, Macmillan. A succinct introduction to the economist's approach to statistical methods, including a good chapter on qualitative choice techniques.

5. P. Sprent (1989) *Applied Nonparametric Statistical Methods*. London, Chapman and Hall. A thorough introduction to techniques which might be more appropriate for Industrial Relations research than many of those currently in use.

6. G.S. Bain and F. Elsheikh (1976) *Union Growth and the Business Cycle*. Oxford, Basil Blackwell. An early example of an Industrial Relations study using multiple regression analysis; it includes a useful set of appendices outlining the techniques used.

7. A. Dale, S. Arber and M. Procter (1988) *Doing Secondary Analysis*. London, Unwin Hyman, Chapters 6 and 7. A clear introduction to using computers software packages.

8. D. Huff (1973) *How to Lie with Statistics*. Harmondsworth, Penguin. An amusing account of how statistical methods can be misused.

9. J. Irvine *et al.* (1979) *Demystifying Social Statistics*. London, Pluto. A critical analysis of the use of statistics and statistical methods in the social sciences.

10. S. Reid (1987) *Working with Statistics: An Introduction to Quantitative Methods for Social Scientists*. Cambridge, Polity. A good introduction to the basics of statistical methods—used by a number of Industrial Relations departments.

APPENDIX: STATISTICAL ANALYSIS AND COMPUTERS

Many of the statistical techniques mentioned in the chapter can be undertaken without recourse to a computer. Those outlined in sections 2 and 3, for instance, including simple regressions, can be undertaken using pocket calculators. However, the more sophisticated techniques require work on some form of computing system and this can be offputting to the computer-novice. Indeed, some students state that their main reason for not using statistical techniques is a fear of using computers. Nowadays, such a rationale is more than ridiculous and ranks alongside claustrophobia and misogyny as a social problem to be confronted and overcome.

There is a vast range of computer technology and software available to the would-be statistical analyst. These make the undertaking of statistical analyses extremely easy and impose few constraints on the degree of sophistication adopted, beyond time and the analyst's knowledge. The objective of this appendix is to mention some of the major options open to the putative statistical analyst and thereby to provide a first step to overcoming computophobia.

A major decision facing the researcher is whether to use a mainframe computer or a personal computer (PC). Until quite recently, this decision has not been on the agenda as most work could only be undertaken on mainframes. However, the increasing power and sophistication of PCs has meant that all but the largest and/or most complex analyses can be undertaken on the new generation of PCs. The problem facing many researchers is that they cannot obtain access to the more powerful PCs and therefore are forced to use mainframes, even if it would be more efficient to do otherwise.

Mainframes are large computers which can process large numbers of jobs at the same time. They can handle both large and small statistical analyses, but their comparative advantage lies in the former area. Most universities have very powerful mainframe computers, to which researchers are given ready access. Each has its own system of operation and the key features of these must be learnt prior to use. By and large, these are easy to learn and cause far fewer problems than learning the statistical techniques themselves.

Personal computers seem more user-friendly to would-be users of statistical methods, mainly because they are also used for word-processing. The requirements for PCs (both of the user and the technology) are, however, typically much greater for statistical analysis than for word-processing, however. In relation to the machine, it is important to use a PC which has sufficient storage capacity to store one's data-set, statistical packages, related programs and most recent results; sufficient random access memory (RAM) to

undertake the most complex task that is required; and sufficient speed of operation to complete the most operations required in a reasonable time.

The choice between using a mainframe and a PC is not usually open to researchers, particularly those in the preliminary stages of their careers. However, for those in the fortunate position of choice, there are a number of considerations which should be borne in mind. Using a mainframe permits the user to tackle a wider range of jobs than using a PC. It also generally allows ready access to support staff who can handle complex technical problems. On the other hand, PCs are more convenient to use and their use for statistical analysis typically builds on skills learnt in their use in other roles, such as word-processing. A key question in this area is the size of the analysis which is to be undertaken—the greater the job, the more likely it is that a given PC will be unsatisfactory.

Alongside the choice of appropriate hardware, the would-be statistical analyst must make a choice concerning software. This typically involves the choice of an appropriate statistical package. These are essentially programs which allow the researcher both to organise his/her data and/or undertake statistical analyses. There are currently a wide range of packages on the market, ranging from derivatives of spreadsheets to highly specialised programs which are associated with a particular approach to statistics. The best known in this area are Minitab, SPSSX and SAS. These are available in both PC and mainframe forms and are to be found on most university computers.

Minitab is the simplest of the 'big three' to use. Its main advantage lies in its use of a conversational language which is readily learned by computer novices. It is a bit more limited than the others, however, especially for analyses which require extensive data-management. SPSSX is the package which is most familiar to social science researchers. It has developed over a number of years and is supported by well-written and comprehensive manuals. It is particularly useful for data management, but also contains an extensive range of statistical techniques. SAS is the most complex of the three. It is not easy to learn, but the effort is more than worthwhile.

Recent years have seen the development of a number of more specialised packages which have reflected the interest of social statisticians in more complex techniques (and the increasing availability of sophisticated hardware to handle these techniques). These are typically limited in the range of tasks which they can accomplish and are generally much less efficient in the data-management area than the 'big three'. Thus, the gains on the swings of technical sophistication are offset by the losses on the roundabouts of data-management. A common response to this problem is to use a 'big three' package for the setting-up of data and then to use a specialised package for the analysis. A specialised package of some relevance to Industrial Relations researchers is LIMDEP, which is especially designed to estimate discrete regression models of the type outlined in Section 5 above.

Some of the simpler statistical techniques can be undertaken on a *spreadsheet.*

These have mainly evolved to perform a number of administrative functions, but some have been successfully used in research projects. Most spreadsheets allow the easy calculation of a wide range of descriptive statistics and some, such as Lotus 1-2-3 and Microsoft Excel, include multiple regression facilities. In addition, data used in a spreadsheet environment can generally be readily transferred to a statistical package environment.

A large number of spreadsheets are in existence and each is focussed on a particular set of functions. For the purposes of statistical analysis, it is the more powerful spreadsheets which are most useful. The market-leader is undoubtedly Lotus 1-2-3. It dominates the spreadsheet market in a similar way to the IBM-PC in the PC market. It contains a range of statistical facilities, including regression analysis. Other spreadsheets which contain some statistical facilities are Microsoft Multiplan, SuperCalc and Quattro. Most are extremely easy to learn and build directly upon skills learnt in the word-processing environment.

To conclude, there are a wide range of options open to the would-be statistical analyst, ranging from the use of a simple pocket calculator to the deployment of specialised packages on a mainframe. Most options require extremely little prior knowledge or learning and only limited data-preparation. Thus, fear of computing facilities should not be a factor which precludes the use of statistical methods in research.

REFERENCES

Bain, G.S. and P. Elias (1985) 'Trade Union Membership in Great Britain: An Individual Level Analysis', in *British Journal of Industrial Relations,* 23 (1), pp.71-92.

Bain, G.S. and F. Elsheikh (1976) *Union Growth and the Business Cycle: An Econometric Analysis*. Oxford, Blackwell.

Bradbury, B., Garde P. and Vipond, J. (1986) 'Youth Unemployment and Intergenerational Immobility', in *Journal of Industrial Relations,* 28(2), pp.191-210.

Cappelli, P. and Sherer, P. (1989), 'Spanning the Union/Nonunion Boundary', in *Industrial Relations,* 28 (2), pp.206-226.

Chapman, B.J. and Mulvey, C. (1986) 'An Analysis of the Origins of Sex Differences in Australian Wages', in *Journal of Industrial Relations,* 28 (4), pp.504-520.

Creigh, S. (1986) 'Australia's Strike Record: the International Perspective', in R. Blandy and J. Niland (eds.) *Alternatives to Arbitration*, Sydney, Allen and Unwin, pp.29-51.

Crockett, G. and K. Hall (1987) 'Salaried Professionals and Union Membership: An Australian Perspective', in *Journal of Industrial Relations,* 29 (1), pp.49-65.

Deaton, D. and P. Beaumont (1980) 'The Determinants of Bargaining Structure', in *British Journal of Industrial Relations,* 18, pp.202-216.

Deery, S. and J. Purcell (1989) 'Strategic Choices in Industrial Relations Management in Large Organisations', in *Journal of Industrial Relations,* 31 (4), pp.459-477.

Heywood, J.S. (1990) 'Who Queues for a Union Job?' in *Industrial Relations,* 29 (1), pp.119-127.

Hiltrop, J.M. (1985) 'Dispute Settlement and Mediation: Data from Britain', in *Industrial Relations,* 24 (1), pp.139-146.

Irvine, J., Miles I. and J. Evans (1979) *Demystifying Social Statistics,* London, Pluto.

Linter, V.G. *et al.* (1987) 'Trade Unions and Technical Change in the UK Mechanical Engineering Industry', in *British Journal of Industrial Relations,* 25 (1), pp.19-29.

Ng, I. and J. McCallum (1989) 'Trade Unions, Economic Growth and Politics', in *Journal of Industrial Relations*, 31 (3), pp.372-384.

Nowak, M. (1988) 'Information Theory and Employer Recruitment Practices', in *Journal of Industrial Relations,* 30 (2), pp.277-293.

Payne, J. (1989) 'Trade Union Membership and Activism Among Young People in Great Britain', in *British Journal of Industrial Relations,* 27 (1), pp.111-132.

Robinson, J.C. 'Hazardous Occupations Within the Job Hierarchy', in *Industrial Relations,* 27 (2), pp.241-250.

Tarantelli, E. (1986) 'The Regulations of Inflation and Unemployment', in *Industrial Relations,* 25 (1), pp.1-15.

Whitfield, K. and Bourlakis, C. (1991) 'An Empirical Analysis of YTS, Employment and Earnings', in *Journal of Economic Studies*, 18 (1), pp.42-57.

13 Put it in Writing! Some Guidelines for Commissioned Report Writing

Michelle Brown

A request (or order!) from the boss to commit the findings of your investigations to paper can send shivers down the back. There is no need to panic, as report-writing skills are not difficult to acquire and adherence to some basic guidelines outlined in this chapter will ensure that your report is well-structured and presented. This chapter works from the understanding that you have read and (followed explicitly!) the suggestions contained in the earlier chapters regarding the conduct of research. It is presented in a report format in order to facilitate and illustrate the discussion.

SECTION 1: OVERVIEW

The emphasis is on the report-writing skills required by the practitioner, though many of the guidelines contained in this chapter are applicable to some types of academic assessment. Effective written communication, whatever the purpose, involves establishing a rapport between the reader and the writer and can be achieved through attention to matters such as clarity of writing style, structure, grammar, referencing and punctuation.

Reports required in the workplace are distinctive from reports submitted for academic assessment in that they may have a wider audience, have been requested for a specific purpose and may be used as the basis for decision making. It is important to appreciate that there is a large variety in the nature and types of reports that you may be required to prepare and submit. The information provided in this chapter needs to be interpreted flexibly in order to

accommodate the circumstances of the commissioning body or person.

Why written reports?

In any type of organisation, information can be communicated in either a verbal or written form. The dangers inherent in verbal communications, especially where the message is to be transmitted through many people, was well illustrated during World War 1 when the Commander on the front line issued a command 'Send reinforcements we are going to advance'. By the time the message was passed on to the Commander of the Reserves, it had become 'Send three and four pence we are going to a dance'!

The growing complexity in the decision-making structures of organisations, time pressures on individuals and the availability of new technology—such as facsimile machines and word processors—has generated a renewed emphasis on reports as a form of communication. Written reports can be an effective form of communication when the subject matter of the report involves complex information and statistical data. Moreover, written reports provide a permanent, comprehensive and coherent account of an investigation. For the report writer, it is worthwhile taking time over the structure and presentation of a report as it is sometimes taken as an indication of the quality of the work discussed in the report and, more importantly, may reflect on the ability of you, the author!

Types of reports

Reports can take on a variety of guises and there are a number of ways in which to classify reports. One classification system[1] emphasises the degree of formality or informality of the report. Formal reports generally contain objectives, method, scope, conclusions and recommendations. Recent examples of such reports would be the *Report of the Committee of Review into Australia's Industrial Law and Systems*[2] and the *Green Paper on Industrial Relations in New South Wales*[3]. Informal reports are usually much shorter in length, may be presented in a letter or memo form and are often used to disseminate information rather than as the basis of decision-making, as is often the case with the formal report. An example of an informal report may be correspondence that details the experiences of a member of staff who has attended a conference. Whether it is appropriate to present your work in a formal or informal report will depend on a number of factors. As a general rule, the more complex and lengthy the report, the greater the distance between your audience and the project you are reporting on, and the greater the report's value is as a long-term reference, the more formal the report should be.

---

1 For a detailed description of the differences between formal and informal reports, see Bowman and Branchaw (1984), page 61 - 72.

2 Report of the Committee of Review into Australian Industrial Relations Law and Systems, *Report*, vol. 2, Australian Government Publishing Service, Canberra, 1985.

3 Niland, J., *Transforming Industrial Relations in New South Wales: A Green Paper*, Government Printer, Sydney 1989.

Another classification system of reports works according to the content of the report[4]. *Periodic* reports are documents prepared on a regular basis, usually providing information on a particular aspect of the organisation. In Industrial Relations, this may involve the preparation of quarterly reports on the record of industrial disputes, wage costs or employee absenteeism and turnover. These reports can provide information on which to base subsequent decisions. *Progress* reports are designed to bring decision-makers up-to-date on developments on a particular issue, for example, recent changes in industrial legislation, or progress in award-restructuring negotiations. Another type of report is the *proposal*. The author is putting forward a document that advocates a particular position on the subject matter of the report, for instance, procedures for dealing with drug and alcohol abuse in the workplace. *Background* papers detail past developments, the responses of other organisations or the history of an issue.

Reports may be required by persons and agencies external to the workplace. The Full Bench of the Australian Industrial Relations Commission, for example, required the parties to the May 1991 National Wage Case to make written submissions, having regard to some guidelines established by the Commission. Government departments may require written reports such as *accidents reports*, employer associations may seek written feedback from member companies on *policy* directions and unions may seek to influence the Australian Council of Trade Unions (ACTU) decision-making through the circulation of *discussion* papers.

SECTION 2: PLANNING

The first step in writing a report is to devote some time to planning. During the planning stage, you need to clarify the purpose of the report. The terms of reference provided by the commissioning person or organisation can establish the parameters of the report, though there is considerable value in checking *your understanding* of the objectives and scope requested with reference to the *commissioning agent*.

2.1 Know your audience

You need to have a clear idea of who is going to read the report. The experience, occupation and educational achievements of your audience, as well as their knowledge of and attitude towards the subject matter of the report, should be taken into account in the preparation and presentation of your report. This information will help determine the language and writing style, depth of coverage, emphasis, terminology and format. Your audience may also establish specific requirements concerning the organisation, format and publication, and delivery of the report.

---

4 For further information on this classification system, see Bowman and Branchaw (1984), page 37-58.

2.2 The Time Horizon

Having now established the parameters of your task, it is important to define the time horizon. A schedule for the preparation, publication and delivery of the report should be developed in this planning stage. The time schedule should make allowance for the preparation of a draft report, a period of time for feedback on the draft and time to incorporate the suggested modifications into the final report. The preparation and circulation of a draft report is a way of ensuring that the final report will meet the needs of the requester, especially when they have been given an opportunity to comment on a draft. If the final report is to be widely distributed, allow sufficient time to organise printing of the appropriate number of copies.

2.3 Skeleton Reports

The planning process may even go so far as to involve the drawing up of a skeleton report. This is a list of the main chapter or section headings and a list of the subjects to be covered under each heading. The advantage of a skeleton plan is that it can be thrown away if it is inappropriate. In drawing up the skeleton report, continuous reference back to the original terms of reference will help ensure that the final report will cover the areas requested by the commissioning agent. Involving the commissioning agent in the early stages, and if appropriate, throughout the life of the project, will help ensure subsequent acceptance of the report.

SECTION 3: STRUCTURE

The formal report traditionally follows the model of an introduction, the main body of the report and a conclusion, which details the recommendations of the author. A report will usually be divided into sections or chapters. Every chapter or section should start with an introduction before the first subheading in order to give the reader an indication of the subject matter. The length of the sections or chapters is up to the author.

3.1 The Introduction

The introduction explains the purpose (terms of reference) of the report, describes the methods used and the main conclusions and recommendations. Depending on the nature of the topic, it may also be appropriate to provide a history or background to the subject matter of the report, an explanation of the scope that you have defined for the report and the order of presentation. This preview of the report tells the reader the arrangement of the topics and is usually the last function of an introduction. It also serves as a transition to the main body of the report.

3.2 Main Body of the Report

The subject matter will, to a very large extent, determine the organisation of the main body of the report. A report dealing with the decisions of the Australian Industrial Relation Commission on redundancy between 1904 to 1991, for example, may be structured chronologically, using significant turning points in Commission thinking as the basis for determining the appropriate time periods. Such a structure would be inappropriate in a report that details the problems facing unions contemplating amalgamation.

3.3 Endings and Recommendations

The third major part of a report is the ending or conclusion. The conclusion has three major functions. Firstly, a summary of the details presented in the main body of the report; secondly, a statement of conclusions and thirdly, recommendations. One of the distinguishing features of a report, as compared with other types of written communication, is the presence of recommendations, based on the discussion and findings of the report. These usually appear in both the conclusion and in summary form at the front of the report. The conclusions and recommendations should follow logically from the body of the report. In addition to these three elements, there are a number of other structural features of the formal report that assist the reader of your report.

3.4 Title and Title Page

The report will require a title and a title page. The title of your report should indicate the subject as briefly and specifically as possible. The title can influence the willingness of your audience to read the report. Consider, for example, the effect of the title 'Phantasmagoric Accounting' on the inclination to readers to embark on this report. The title page will also need to indicate whether the report is a draft or final report. The name of the author or organisation, address, date of issue and any indication of copyright or confidentiality should also appear on the front page. The title page from a recent Business Council of Australia report is provided as an example[5].

3.5 Summaries

In some reports, you will find a summary, also known as an executive summary, at the front of the document. Sometimes on different coloured paper or distinguished by the style of print, the executive summary provides a succinct overview for the reader, including recommendations. In writing a summary, one must not change the emphasis of the report. The summary is a microcosm of the report. In very large reports—for example, the Hancock Committee Report—the summary is often a separate document. This should be prepared after the report proper has been completed and may be presented in point form.

---

5 Business Council of Australia, (1989) *Enterprise Based Bargaining Units:* A Better Way of Working, Business Council of Australia, Melbourne.

3.6 Contents Page

The contents page should list the chapters and sections within chapters, giving page numbers. If you have planned the report adequately, the contents page should evolve quite naturally from the report itself. A list of all tables, figures and illustrations should follow the contents page. The next page provides an example of a contents page[6].

3.7 Bibliography and Appendices

At the other end of the report, you will need to include a bibliography of all the sources of information used in the preparation of the report. Following the bibliography are the appendices. Long and detailed information, such as questionnaires and glossaries, should be included in the report by way of an appendix, though the author should make sure to refer to these appendices at the appropriate locations in the report. Take particular care in determining what should go in an appendix. Remember that the information contained in the appendix should add to the quality of the report—not just its weight and volume!

SECTION 4: PRESENTATION, LANGUAGE AND STYLE

Written communications are in many ways more complicated than verbal communications, as it is impossible to gauge the readers reaction to your report. There are, however, some measures that the report writer can take which will enhance the readability of the report and maintain the interest of the reader.

4.1 Presentation

The physical presentation of a report can affect its readability. A typed report will look far more professional than one that is hand-written. A document with margins of approximately one inch will appear more reader-friendly than one where every inch of the page is covered in writing. This is also the case with enumeration—the numbering of sections or paragraphs in the report. A reader can be put off by pages of information unbroken by enumeration or headings. Numbered point or paragraph form, and the headings and subheadings in a report, are useful in conveying the areas covered by the report and assisting readers to locate the discussion and recommendations of direct interest to them. Personal preference and the available technology will, however, ultimately determine the 'look' of your report.

---

6 Taken from Australian Council of Trade Unions, (1987) *Future Strategies for the Trade Union Movement*, (Final), ACTU.

ENTERPRISE-BASED BARGAINING UNITS

A BETTER WAY OF WORKING

Report to the
Business Council of Australia
by the
Industrial Relations
Study Commission

Volume 1

July 1989

CONTENTS

4.2 The Language of Reports

A reader's understanding and perception of your report will be influenced by the language you employ. The words you include in your report can reveal your value system and position on the subject matter of the report. Plain English and gender neutral language are currently being promoted as important elements in effective written communications.

In business reports, it is important to be clear, concise and correct. Take particular care with the use of technical terms—in Industrial Relations, there are many terms which, although easily followed by the seasoned practitioner, may well be unintelligible to someone unfamiliar with the area. For example, the use of words like 'ambit', 'log of claims', 'preference' and 'commission' have quite specific meanings, which should be defined if your audience is not fully conversant with the area.

Common abbreviations also fall into this category, such as abbreviations for unions, employer associations and industrial tribunals. In short reports, giving the full name and the abbreviation in brackets the first time it appears in the report will be sufficient. In the event of there being a large number of acronyms, abbreviations and technical terms, a glossary attached to either the front or back of the report will assist the reader and the 'flow' in the main body of the report.

Avoid the use of loaded or emotive language in a report. In the context of a report on industrial disputation, for example, it is not appropriate to describe the dispute as 'the work of radical left-wing militants' or 'due to management intransigency'. Both of these examples create a particular impression in the mind of the reader which may not have been detailed in the report and cannot be substantiated by it.

Refrain from the use of figures of speech and clichés as they may not be familiar to your audience. The expression that the workforce is 'out on the grass' or that the union is engaged in 'feather bedding' practices are well known Industrial Relations expressions. To the unsuspecting reader, however, these expressions may be taken to mean that the workers are high on the effects of marijuana or refer to the nocturnal habits of union officials![7] Such figures of speech create ambiguity in the mind of your reader and are generally out of keeping in a serious business document.

Vital to effective report writing is emphasis. This involves accentuating the important ideas, facts, and concepts so that your reader quickly grasps those things that are most significant. The positioning of your main points is notable in this regard. Locate your important points either at the beginning or the end of a sentence—do not bury them in the middle of a sentence. Questions can draw

---

7 'Out on the grass' refers to the situation where workers are on strike, often having congregated on the grass outside of the workplace. 'Feather bedding' refers to excessive levels of employees being employed due to an agreement with a union.

attention to a particular point, as can repetition, the explanation mark, short paragraphs and sentences, underlining and capitalising. Appropriate use of punctuation, upper and lower-case letters and spacing indicates to the reader the way to decipher the report and those things that are to be emphasised.

4.4 Grammar

Be careful with spelling, expression and footnoting—it is not just your lecturers that are concerned with such matters. Poor expression and incorrectly spelt words can create an unprofessional image and annoy the reader! The advent of word processors with spell-check facilities should minimise the number of spelling errors, so be sure to use them. Also, allow time to proof-read the final report, as a word may be spelt correctly but inappropriate in that context. This was well-illustrated in divorce proceedings, where the husband had filed for divorce on the grounds of desertion. There was a passage in the husband's affidavit in support of his petition which read as follows: 'My wife refused to wash my shirts'. The judge dryly said to the husband's counsel, 'If your copy of the affidavit reads the same as mine, I don't blame her'. The typist had left the 'r' out of shirts[8].

SECTION 5: USE OF DATA AND VISUAL AIDS

Your investigations may have involved the collection of some statistical data, for example, wage rates in a number of federal awards. This data can be presented in a number of ways, including tables, pie or sectoral charts, histograms, line graphs, bar charts and diagrams. These graphics can convey a consider amount of information with only a few words. They present, simply and clearly, large blocks of information without all the connecting devices needed in prose. Moreover, such presentational forms can be a most striking and vivid means of conveying information; they are a most dramatic and effective means for making comparisons; they can aid the understanding of the reader through simplification, as well as helping to hold the reader's attention throughout the report.

5.1 Arrangement of Data

In order to achieve the advantages of using statistical data, have regard for the type of display that is most appropriate to the purpose of your report and that will present your data in the clearest, most effective way. Do not use so many visual aids that your reader will feel it is a picture book rather than a serious report! When figures are presented in tables or charts, you should interpret the most significant ones for the reader in the body of the report and provide appropriate explanations of the source and scale used in the diagram. Below is an example of statistical data presented in a table[9].

---

8 Gillespie-Jones, A.S., *The Lawyer Who Laughed Longer*, page 27.

9 Taken from Committee of Review into Australian Industrial Relations Law and Systems, *Report*, vol. 2, AGPS, Canberra, 1985, page 252.

Table 6.3: The Proportion of Persons covered by state and federal awards in May 1983.

	Federal %	State %	Total (a) %
New South Wales	31.4	54.0	86.1
Victoria	43.6	40.1	84.6
Queensland	24.1	64.3	88.5
South Australia	33.9	52.8	86.9
Western Australia	19.9	62.6	82.9
Tasmania	35.4	51.0	88.5

(a) Includes small number of employees covered by unregistered collective agreements.

In relation to the presentation, ensure that each table or chart is not divided across more than a page and that charts that fill a page should be included in the page-numbering system, that is, not given supplementary numbers like 16a (after page 16 and before page 17). The graphics should be large enough to be read easily. Give each table a number and a title and locate it as closely as possible to the discussion in the text.

5.2 Other Types of 'Visuals'

There are a number of other visuals that you may wish to include in your report, such as photographs, flow and organisational charts, maps and location charts, cutaway and exploded diagrams. Cutaway and exploded diagrams are most valuable when the writer is trying to describe both the assembly and the working of a complicated piece of mechanism. Follow the same guidelines for the presentation of these types of visuals as for statistical information outlined earlier.

SECTION 6: CONCLUSIONS

The final task of the report writer is the preparation of a transmittal memorandum. This is a memo formally handing the report over to the commissioning agent. All that remains to be done is to enjoy the accolades that flow from a well-written and skilfully presented report!

REFERENCES

Australian Council of Trade Unions (1987) *Future Strategies for the Trade Union Movement* (Final), ACTU, Melbourne.

Bowman, J.P. and Branchaw, B.P. (1984) *Business Report Writing,* The Dryden Press, Chicago.

Business Council of Australia (1989) *Enterprise-Based Bargaining Units:* A Better Way of Working, Volume 1, Business Council of Australia, Melbourne.

Committee of Review into Australian Industrial Relations Law and Systems, *Report* (1985) Vol. 2, AGPS, Canberra

Denniss, V.R. (1963) *The Essentials of Report Writing,* Australasian Publishing Company, Sydney.

Gillespie-Jones, A.S. (1982) *The Lawyer Who Laughed Longer,* Hutchinson of Australia, Melbourne.

Hooper, J. and Janis, J.H. (1981) *Writing and Communicating in Business,* Cassell Australia Limited, Melbourne.

Jensen, R.E. (1976) 'Phantasmagoric Accounting', in *Studies in Accounting Research,* American Accounting Association.

Pearsall, T.E. and Cunningham, D.H. (1982) *How to Write for the World of Work* (second edition), Holt, Rinehart and Winston, New York.

Poe, R.W. (1982) *The McGraw-Hill Guide to Effective Business Reports,* New York.

Sussams, J.E. (1983) *How to Write Effective Reports*, Gower, London.

Wyld, L.D. (1967) *Preparing Effective Reports,* The Odyssey Press, New York.

14 Righting It Up

Norm Dufty

So you thought that there was a mistake in the title? Well, if you did not, you really **have** got a problem! But what sort of mistake? Was 'righting' an incorrect spelling of 'writing'? Or was the word used correctly in the sense of righting a wrong—or righting a sail board that had fallen over? Or did you 'cotton on' to the real explanation—that this was a 'gimmicky' way of saying that in writing up a thesis, it is very important to get it right? All this emphasises the importance of communication—and you have to communicate with the examiner.

This chapter makes a few comments, hopefully helpful ones, about various aspects of writing up a thesis. The assumption is made that you have long ago read the rest of the book and that you have got your data collection and analysis techniques sorted out, collected your data, tested your hypotheses, *etc.* The stuff is all written in long hand in a heap on your desk—and probably all over the floor as well. So now what?

The first principle to observe, and one which takes precedence over all others is: **remember that you are addressing an examiner.** You are not writing for posterity, or to please yourself, or to air your own views irrespective of the evidence. The moral is, keep your eye on the ball.

NUTS, BOLTS AND COSMETICS

Equipment

Presentation is important. No thesis is ever failed for poor presentation *per se,* any more than it is for poor spelling, *etc.*, but, contrary to what you might have been led to believe, examiners are human. A well-presented piece of work from a laser printer in a readable typeface sets a favourable climate—conversely, with a poorly presented one done on a 72 dots per inch dot-matrix printer or a manual typewriter with a cloud of white-outs, or, worse, a multitude of errors, even if

corrected in ink afterwards. The moral is:

1. Get yourself or get access to a personal computer and a good word-processing programme with a spelling checker, and if possible a grammar checker. (The point about a spelling checker is that it picks up many, **but not all**, of your spelling errors. It will not correct the use of 'their' instead of 'there', for example. Even if your spelling is perfect, the spelling checker picks up most typing errors, enabling even the novice typist to work very quickly in the knowledge that the checker will locate the errors later);

2. If this is not possible, get a girl friend/boy friend/ spouse with the above;

3. If this is not possible either, or would involve too much self-sacrifice (after all, prostitution is wider than just sex for money), hire someone with the above.

By far the major advantage of the word processor is that it allows you to modify your writing by changing the way in which you have said something, or by re-arranging the order of paragraphs, *etc.*, without extensive re-typing. If you are using the typewriter yourself, and even more so if you are paying for the typing to be done, there is an understandable reluctance to make changes involving massive re-typing for what may be only a marginal improvement. But that marginal improvement may mean the difference between success and failure—or at least success and a deferral.

Almost as important, and related to the above, is the fact that any fool can produce a professional-looking document on a word processor, given enough care and application, whereas without typing skills, it would verge on the impossible. And I speak from personal experience. It not only saves money if you do it yourself, but you think of improvements as you go along, as you transfer from the long-hand rough draft to the finished thesis.

When you get adept at using the word processor, you will find that the need for a rough, hand-written draft disappears and your text goes straight onto the machine. In the comments above, it was assumed that your material was already in hand-written draft form. But if you are reading this **before** you have really got into the topic, start it off on the word processor. Type up your material quickly and do not worry too much about errors; they are easily corrected afterwards.

In your literature review, you can take notes of the material as you acquire it and sort it out in logical fashion later, using the cut-and-paste function on the word-processing application. But do not to forget to record the full reference and the page numbers of the material as you read through it. Use quotations extensively; you can always paraphrase afterwards if you decide not to quote directly, but you cannot do it the other way round. For use in the library, it may be possible to buy or borrow a lap-top computer that will allow you to down-load your material onto your own PC—the battery-operated Z88 (weighing less

than 1 kg and the same size as an A4 sheet of paper), for example, can download onto Macintosh or IBM compatible PCs.

More on Presentation

Now a word on typography. The unfortunate examiner who has to read through your thesis has got enough to cope with in comprehending what you are on about without you making it more difficult by using a lousy type-face. Australian research has revealed some remarkable differences in comprehension according to the typeface used. Over 50 years ago, the eminent English typographer, Stanley Morison (1936), said that "... any disposition of printing material which, whatever the intention, has the effect of coming between the author and the reader, is wrong" (cited in Wheildon, n.d.:S). The experimental evidence is very clear—a serif typeface, such as Times, is much preferable to a sans-serif typeface such as Helvetica. (A serif typeface is one in which the letters have 'feet' or serifs; these serifs give the eye a place to stop and recognise the shape of the letter.) These two typefaces are mentioned because they are widely used and available on virtually all personal computers. They are easily handled by low-cost high-quality printers such as the Hewlett Packard Desk Writer, as well as the more expensive laser writers.

To most typographers, a sans-serif face such as Helvetica is neater and cleaner than the serif typeface such as Times, and in terms of aesthetic appeal, they are probably right, but in terms of comprehension, the serif faces are well ahead. Wheildon's (n.d.:15) research on a sample of well-educated Australians (we assume thesis examiners fall into this category!) shows the following:

	Comprehension		
	Good	**Fair**	**Poor**
Layout with serif body-type	67%	19%	14%
Layout with sans-serif body-type	12%	23%	65%

This startling difference was underlined by the comments from the readers; referring to the sans-serif typeface, 53% found it difficult to read, 22% had difficulty in focusing on the type after a dozen or so lines, and 10% said that they continually had to back-track to maintain concentration.

Two other important 'no-nos'—do not use all-capital headings, a mixture of first-letter capitals and lower case is easier to read; and do not underline, as this also impairs readability. If you are using a word processor and want to emphasise a word, a short phrase or a sentence or two, use **bold** type rather than underlining. Reserve *italics* for the titles of books or journals—the common practice in academe of underlining book and journal titles was a useful device in the days of steam-driven typewriters. In this era of word processors, use italics for titles, as is the common practice in typeset material. You will very

rarely find underlining used for journal and book titles in text books, monographs or Journals.

Spelling and Punctuation

One of the myths perpetuated by Vice-Chancellors in their public utterances is that a university degree at least ensures that the recipient is literate. This is true in some cases, but only some. Your problem is that thesis examiners **expect** people who write theses to be literate. Pocket your pride and admit that you may have some problems in this area and do something about it.

Spelling is important for two reasons. If your thesis contains spelling errors, the examiner will think that you are a slob—after all, if you cannot get the spelling right, what else have you got wrong? Secondly, a spelling error may change the meaning of the word, leading you to say something that you did not mean. Consider this tragic story. An elderly gentleman engaged to marry a much younger lady went along for a medical examination to confirm that he could perform his marital duties. The doctor gave him a note to give to his fiancee which said, *inter alia,* that '...he should be capable of sexual intercourse once weekly'. Shortly after the honeymoon his wife phoned the doctor and asked him if he was sure that he used the correct spelling of 'weekly'.

Punctuation is also important for the same two reasons as listed above. Getting the punctuation wrong can change the meaning of a sentence. Ponder this case of a simple punctuation error. A man had been in hospital seriously ill and, as part of his convalescence, went away to stay with a relative in a remote location without a telephone. His letters home indicated that he was improving rapidly. His wife was therefore surprised to receive a telegram which ran 'Not getting any better, come at once'. She went down to the post office to see if there had been a mistake—there had, a punctuation error. The telegram should have said 'Not getting any, better come at once'.

Another set of related errors which annoys examiners is the incorrect use of words and carelessness with things like titles. One candidate writing a thesis on unions said, in a case study on the use of preference clauses, that "...Kennedy had allowed his membership in the union to deteriorate..." when he obviously meant 'lapse'. Another PhD hopeful consistently referred to the 'Vice Presidents' of the former Arbitration Commission when he obviously meant 'Deputy Presidents'. This may provoke this sort of comment from an examiner:

> The thesis is marred by a somewhat idiosyncratic and journalistic use of the English language, mainly the incorrect use of words and the invention of some new ones. There is also a tendency to use hyperbole instead of facts—legal costs are 'incredible' or 'enormous'—the bills are never in $—and decisions are 'infamous' rather than, say, 'ill-advised'.
>
> A number of statements need re-wording because their meaning is unclear or because they are couched in shocking journalese. In a large number of other cases words are used

> incorrectly in terms of their meaning or in the grammatical sense—or words like 'financiality' are invented.

No candidate is ever failed for committing the sins noted above—but their commission gives the examiner a bad impression. When a more serious error arises the examiner may then not give the candidate the benefit of the doubt on the grounds that if he/she gets the spelling and the titles wrong, then he/she is likely to be wrong on the substantive issue.

Referencing

There is no single right way to reference, but the Harvard system is very widely used and has much to commend it. (When quoting legal references, it is advisable to use the conventional legal notation system and standard legal abbreviations—CAR for *Commonwealth Arbitration Report,* for example.) The bottom-of-the-page footnote system is also acceptable, but the examiner faced by the umpteenth *op.cit.* is likely to get a little testy as he/she searches back for the page with the original reference on it. The numbered reference system on a chapter basis is even worse, but the absolute pits is the system of using numbered references by chapter, but putting them all at the end of the thesis. To check on reference 5 in Chapter 4, the examiner has to turn to the end of the thesis and then find out where on earth the references to Chapter 4 are located. This is likely to drive the examiner up the wall (at least it does that to me).

Most examiners—or, at least, speaking for myself—like to know the source when the quotation or citation is read and the Harvard system gives the clue on the spot and succinctly. If the examiner is as familiar with the subject as he/she ought to be, then in most cases the author's name and date will suffice—it will not be necessary for the reader to refer to the alphabetic list at the end of the thesis. For example, a reference to (Dunlop, 1958:34) clearly means Dunlop's *Industrial Relations Systems,* the examiner would not have to turn to the list of references to identify it.

If you do not do your referencing carefully, you might get something like this in the examiner's report:

> The candidate's referencing is incredibly sloppy. He rarely cites page numbers, author's names are inconsistently spelled. For example, are 'S. Rockam 1972' and 'Stein Rophan, 1972', both on page 56, the 'Rochan, S. (1972)' in the bibliography? We have Nylhen, Nylehn and Nylhene—which, if any, is correct? Even the bibliography itself is not in alphabetical order.

Quoting

The dividing line between the use of a reference and plagiarism is not as clear as some people imagine. In the first place, always acknowledge any source of material or ideas. There are three reasons for this. Firstly, it is matter of professional ethics. Secondly, if you do not, you might get caught. (There was one case where a candidate copied large chunks from a monograph without acknowledgement and was unfortunate enough to have the author of the monograph as an examiner. The thesis was failed outright.) Thirdly, in citing an opinion, there is the risk that the examiner will strongly disagree with it, so why should you take the blame when you only copied it from someone else?

The difficult cases are those in which you take a substantial portion of material from a reference, (but not as a quotation), and only cite the author in the first line. The examiner is then uncertain as to where the reference ends and possible plagiarism begins. The safe way is to insert key phrases every few sentences showing that you are still using the reference. For example, you may start off by saying "Dunlop's (1958:56) views on the place of power in the industrial relations system are ..." Then if you are still paraphrasing Dunlop several sentences later, insert a phrase such as "He goes on to say that...." which indicates that you are continuing to state Dunlop's views.

The issue of when to use direct quotations is not simple either. They should definitely be used when the matter is controversial, when the precise wording of the author is important, or when you want to take advantage of the author's colourful phrase or quotation of someone else's colourful phrase. For example, when one writer (Dufty, 1990:15) wanted to show that a particular person was rather 'difficult', he used a quotation which expressed this very well by selecting a phrase which would not have been appropriate for him to use—he said "Moxon was a prickly character, referred to by a later President of the Court (Burnside) as a 'fathom of barbed wire' (Somerville, 451A:701)".

The delineation of the quotation is also worth attention. As a rule of thumb, a quotation of more than three lines should be indented half an inch at each end and not put in quotation marks. For example, a short quotation might be in the form:

Batstone (1988:238) says that the "...time period we are considering when we define 'order' is also relevant..." and emphasises the importance of this aspect of any discussion of 'order'.

Note the use of three periods preceding the first word and after the last word indicating that 'time' was not the first word of the sentence nor was 'relevant' the last word. On the other hand, a more extensive quotation would be done this way, with the three periods in the middle of the sentence indicating that you omitted a phrase or sentences(s) which was redundant to the point of the quotation and did not change the author's intended meaning:

In Batstone's (1988:238) discussion of 'order', he has this to say:

> *In the main, 'order' would seem to refer to the existence of industrial peace (and possibly consensus) along with industrial efficiency ... and the satisfaction of certain interests (the precise nature of which is a matter of considerable disagreement).*

If there is some particular point in the quotation that you wish to emphasise but which the author did not, put it in bold type and acknowledge that you did it, for example:

In Batstone's (1988:238) discussion of 'order', he recognises the place of industrial efficiency:

> *In the main, 'order' would seem to refer to the existence of industrial peace (and possibly consensus)* ***along with industrial efficiency*** *[my emphasis] ... and the satisfaction of certain interests (the precise nature of which is a matter of considerable disagreement).*

You will also note that Batstone uses single quotes for the word 'order', indicating that he allocates a special meaning to it; double quotes should be reserved for un-indented quotations.

The following is a quotation from an examiner's report which underlines the importance of correct referencing (and the need for clear expression):

> Chapter 1, on technological change, is a confused mish-mash of ideas. Unpaginated quotes from Marx are interspersed with meaningless statements (p. 10) such as—"The process of alienation by the capitalist mode of production was also clearly seen by Marx which again is reflected in the Scandinavian labour movement" ... After mentioning an uncited reference (Alfsen) to make a vital point, he contributes this pearl of wisdom—"Management could be wishing for a technology that gives them increased control, but they could end up with one which is effective along completely different dimensions than that of control." (p. 20)

Or take this example:

> The discussion of pluralism is confused by the fact that the candidate refers to **Hugh** Clegg's views on this subject without citing any reference to his work or to the fact that it is this particular author he is talking about, one can only infer this. The sole reference to Clegg is to Clegg and Dunkerley, and this Clegg (Stuart) is a Marxist whose views are radically (no pun intended!) different from those of Hugh Clegg.

Gardening Hints

"A garden is a lovesome thing, God wot ..." says the poet, but a thesis can be a loathsome thing to the examiner if you have not done some of the essential gardening tasks—weeding and pruning. There is always the temptation to leave something in because you have already written it- and having gone to all that trouble it seems a shame to cut it out. The merit of a thesis lies in its substantive content, not in the number of words and it takes time and care to reduce it to its essentials. Remember what Mark Twain said— "I am writing you a long letter, I have not time to write you a short one".

Weeding consists largely of plucking out things that should not have been there in the first place; in some cases this amounts to micro-editing. For example, never say 'at this point in time...' when you mean 'now'. Again, in your literature review you may have written several pages about studies of the rate of absenteeism of Turkish migrants in Australian industry. When you finally got the sample of workers for your study, you found that there were no Turkish migrants in it, so you naturally could not explore this particular issue but had to confine yourself to the nationalities which were actually represented. If this happens, you must weed out the section on Turkish migrants from your survey of the research on absenteeism of people from different countries.

As far as pruning is concerned, in some cases you may be faced with a dilemma about how much to include on detailed procedures that you have used in matters such as sample selection, arrangement of interviews, *etc.* There is always a possibility that one examiner will regard this information as superfluous and another will complain if you do not include it. The solution in these cases is to put it in an appendix; the examiner who wants it can get at it, but it does not get under the feet of the examiner who does not want it. Similarly, the same applies in cases where you accumulate data on people and/or institutions, awards, *etc.*, which do not really show anything. For example, in a sample of workers you may find that there were no significant differences between males and females as far as age, country of birth, length of service, level of education, *etc.* The appropriate tactic in such a case is to state in your findings that there were no significant differences, but put the voluminous tables which do not make any contribution to your findings (except a negative one) in an appendix. To stay with the gardening simile, you have done the pruning, but your thinnings remain on the garden rubbish heap in case the examiner wants to go rummaging for them.

In your literature review (see below), you might read some particular article that makes a point and this is then supported by research done elsewhere. For example [references not given]:

> Miles and Ritchie (1968/69) found that union officials at a number of manufacturing plants in the mid-west of the US expressed strong preference for extending the range of their negotiations with management beyond the usual arguments over grievance procedure into substantive matters such as rates

> of pay. They were prevented from doing this by the nature of the collective bargaining contract. In the UK, Pedler's (1973) interviews of shop stewards showed that over half of those in his sample said that they would like to extend the scope of their negotiations with management. This was not possible under the area agreements between their union and the companies concerned.

But all this could have been put more succinctly in the following form:

> Studies in both the UK (Pedler, 1973) and the US (Miles and Ritchie, 1968/9) indicate that shop stewards would prefer to extend the scope of their negotiations with management beyond the limits set by their respective institutional frameworks.

This would be an example of pruning rather than weeding.

SUBSTANTIVE MATTERS

Structure

The structure of a thesis normally consists of three 'tellums' of unequal size:

> Introduction—tell 'em what you are going to tell 'em
> Main Body—tell 'em
> Conclusion—tell 'em what you told 'em

The cardinal rule is to **never** finalise the introduction until you have written the conclusion. Almost inevitably, you start out with a set of intentions as to what you are going to do but, further down the track, you change your mind as promising avenues open up or obstacles prevent you from carrying out your original intention. There have been many cases when the stated purpose and plan as set down in the introduction was not completely followed in the main body of the thesis. The changes may have been intentional and quite justified under the circumstances, but the introduction was never amended to bring it in line with reality. One of the first things the examiner does in making a final determination on a thesis is to decide whether the candidate did what he/she said was the objective of the exercise. This may seem an elementary point, but you would be surprised how often it is neglected.

Obviously, the main body is the 'guts' of the thesis. If possible, the chapters in the main body of the thesis should relate to the major research questions, hypotheses or sub-divisions of the introduction. It is normal but not mandatory to start off with the literature review, although some people (not me) prefer to see that in an appendix; but material such as interview schedules and questionnaires should certainly be in appendices. In many cases, of course, your research questions and hypotheses are derived from the literature search—

in other cases, you conduct your literature review around the research questions or hypotheses. More often than not, the two interact. You start off with certain research questions and your literature research suggests other ones, or subsidiary questions, that might be added.

The concluding chapter should contain your main findings, summarising in point form if your material lends itself to this arrangement. In the case of hypothesis testing, repeat the hypothesis in full—do not say 'The data support the first hypothesis but not the second one' as by this time the examiner will have forgotten what the hypotheses were and will have to search back in the main body for them, while at the same time thinking dark thoughts about whoever wrote the thesis you.

It is also important at this point to refer back to the introduction where you stated what you were going to do and convince the examiner that you have done it. The quotation below is from an examiner's report and illustrates this point along with one or two others:

> In his introduction (p.l), the candidate states that he will "... explain how new technology ... has made these two relatively small countries important industrial nations." That is the last we hear of this proposition. He then goes to what appears to be the real purpose of his thesis, to refute the idea that industrial democracy is a barrier to technological change, referring to evidence put forward in a probably non-existent and certainly non-referenced paper by Clegg, Dahrendorf and Pool. Pool(e)'s work is his main target and he manages to spell his name incorrectly with almost complete consistency.

You can now perhaps see why it is suggested that you write the introduction—or at least the final version of it—after you have written the conclusion.

Literature Review

The idea of the literature review is to show the examiner that you have made a thorough search of what others have done in your field of interest. This is important, as your own findings can then be related to the work of others, in some cases confirming what they have found, in other cases not supporting it. In your conclusion, you then need to comment on these agreements and discrepancies. Much of the research that you have reviewed has probably been done in countries other than Australia, in industries other than one you have studied, in times other than the period that you have surveyed. You can then speculate that your failure to confirm their findings is due to the different institutional setting, the different time period, *etc.* If you do confirm their findings, then you can say that the underlying principles are robust, as they applied in the Australian setting as well as that of the particular research that you cited. In other cases, your search will throw up conflicting findings and your results may confirm one or the other and again you can come up with possible reasons for this.

It is important to do your literature search first, before you have finalised your hypotheses or research questions. You might find material in your search which suggests additional hypotheses to be tested or research questions to be asked. Another point to remember is do not confine your search to mainstream Industrial Relations journals or to your own basic discipline. Obviously, you cannot spread your search area on a random basis—do it by locating survey type articles which will give you leads into unfamiliar country. Spinrad's (1960) paper on union participation is a good example of this, although it only covers the pre-1960 period. More recent examples are a paper by Doucouliagos (1991) which surveys the literature on economic theories of the technical and social determinants of productivity, and one by Zappala (1988) which examines the literature on workplace industrial relations in Australia. Even if you cannot find a review of this type, the articles and books that you do find will give you further leads through the works that they cite. The real problems of a literature review are where to stop and how much of each thing that you find should you include. Perhaps the best way is to take fairly full notes on everything and then boil it down, especially when you find similar results—as in the example under the 'Gardening Hints' heading above.

The following is a highly concentrated example [for the full list of references, see his paper] of a literature review (Doucouliagos, 1991:90):

> Numerous studies indicate the significance of social variables to productivity [see, for example, Filer (1980), Rosow (1981), Rosow and Zager (1982), Weisskopf, Gordon and Bowles (1983), and Jecchinis and Papavassiliou (1990)]. A number of studies have established a relationship between a firm's industrial relations and productivity. For example, Katz, Kochan and Gobeille's (1983) investigation of 18 General Motors (US) plants found that factors such as absenteeism, grievance rates and the union-management climate were strongly related to productivity. Similar results were derived by Katz, Kochan and Weber (1985) for 25 plants of a US manufacturer, where grievance and disciplinary actions influenced productivity performance. Norsworthy and Zabala's (1985) study of the US automobile industry found that worker attitudes influenced productivity. Ichniowski (1986) found an association between grievance filing rates and productivity in nine unionised US paper mills; the greater the rate of grievance the lower the mills' productivity. Davies and Caves (1987) look at the influence of labour relations on British productivity performance, by estimating a neoclassical model, with allowance for the influence of strikes, restrictive practices and the cost of management in dealing with industrial relations problems. They found only a weak and unclear link between industrial relations and productivity. Metcalf (1990), however, argues that there is a link between industrial relations and the 'productivity miracle' in British manufacturing. Ichniowski (1986:78-82) identifies two effects through which

> industrial relations influence productivity. The displacement effect involves working hours diverted from productive work and used up in grievance handling procedures. The worker reaction effect reflects changes in employee effort.

If you were working in this subject area, you would then discuss in more detail those studies which were relevant to your particular survey and then, **in your findings, not in the review,** bring out the examples of where your results supported those of other researchers and where they did not, together with your assessment of why the differences occurred.

Logic

The problem of causal connections in Industrial Relations, and the social sciences in general, is enormous. Modern statistical techniques and computers place very powerful weapons in the hands of the researcher, but causation and its direction are difficult to establish. Consider this parable. A young man who owned a small cabin cruiser was rather keen on a certain young lady and asked her if she would care to come sailing with him at the weekend. She agreed but mentioned that she was prone to seasickness. Our young friend went into his local pharmacist on the Friday evening and purchased a packet of condoms and some anti-nausea pills. The weekend went well and he went into the pharmacists on the following Friday with a repeat order; this happened again on the following week. The pharmacist could contain his curiosity no longer and asked the young man if he could ask him a question. The young man agreed and the pharmacist said 'Why do you keep on doing it if it makes you nauseous?'.

Let us examine the assumptions that the pharmacist made. First, he correctly assumed that there was a logical connection between the two purchases. This was not obvious from the 'facts', the anti-nausea tablets **could** have been for his father, who was prone to airsickness and made regular inter-state trips. Secondly, and this was his downfall, he assumed that both purchases were for the purchaser's own use; there was no evidence either way from the 'fact' that one individual made the two purchases—it was an assumption.

Industrial Relations research, and research in the social sciences generally, is replete with problems of this nature. For example, there is a high correlation between support for the ALP and favourable views of trade unions—this is clearly established by many surveys. But what is the direction of causation—does a person view unions favourably **because** he/she is an ALP supporter? Or is he/she an ALP supporter **because** of his/her favourable view of trade unions? Or is neither true because both views stem from an ideological stance originating in some common cause such as work experience, family socio-economic status, *etc*?

The Industrial Relations literature is full of examples of the simplistic drawing of conclusions based on statistical evidence. For example, it can be shown that the Australian public have a very jaundiced view of unions; it can also be shown that

statements in the media are generally anti-union. But does media influence public opinion, or merely reflect it? After all, most of the material presented in the media is written, spoken or scripted by unionists—members of the Australian Journalists' Association. The reality is much more complex than some simple causal connection, especially as it has been shown that people in general do not get their views of unions from the media, but from personal experience and the influence of peers (Dufty, 1981).

As another example, strike statistics (even accepting that international comparisons are difficult) show that Australia has more time lost due to strikes than most countries, although this varies a lot according to the time period considered. Strikes are also influenced by the level of unemployment and the rate of inflation. In an attempt to isolate the institutional variable of the compulsory arbitration system, one piece of research used data corrected for inflation and unemployment and found that because the corrected Australian strike losses were similar to those in other countries, **therefore** the institution of compulsory arbitration made no difference. What was **not** considered was whether the compulsory arbitration system itself contributed to inflation and unemployment. In other words, the compulsory arbitration system may have affected strike activity through the intervening variable of inflation. (One of the best examples of the treatment of intervening variables is the study by Nicholson, *et al.* (1981) of a white-collar union.) Obviously, in the majority of cases, you cannot explore the full gamut of possible intervening variables; but it is important that you let the examiner know that you are aware of the possibilities, even though the resources available to you did not allow you to do this, and mention this exploration as a topic for future research.

Values

It might be nice to pretend that your thesis is going to be objective and free from value judgments. Forget it, it cannot be done. As Myrdal (1942:Appendix 2) says, valuations in the social sciences cannot be eradicated by 'keeping to the facts'. In the first place, the very fact that you have chosen a particular topic is a value judgment. You, or the organisation that put up the research money, decided that the phenomena that you have examined were important enough to be investigated (see Lynd, 1945). Further, by using a specific discipline—economics, for example—you have implicitly decided that the other aspects of the problem are inconsequential, or at least are less important. In other words, in 'keeping to the facts' you have selected those facts which are relevant not only to the topic but to the discipline of economics.

One of the many areas where this problem arises is in the study of strikes. For example, Creigh and Makeham (1982) find a clear statistical relationship between the two economic variables of the rate of inflation and the rate of unemployment, and time lost due to strikes in a number of countries, their equation accounting for a high percentage of the variance (>70%). Yet Hibbs (1978), operating in a political-science frame of reference, explained an astonishing 96% of the variation in strike activity in a number of countries by the changes in the power of social democratic parties. Can they both be right? The

answer is: maybe. Referring to the question of intervening variables mentioned above, if the assumption is made that social democratic governments are better at containing and reducing inflation, then the connection is made. This assumption, of course, would have to be tested empirically before it became a conclusion. The point being made is not that all Industrial Relations theses should embrace all academic disciplines—something approaching the 'impossible dream'—but that you should acknowledge the possible relevance of factors outside the frame of reference encompassed by the discipline that you have chosen. In choosing a particular discipline, as well as in the choice of topic, you have made a value judgment.

The essential fact is that, whether you like or not, there are value judgments in your thesis. This is inevitable. It is therefore very important to state them clearly in your introduction, so that the examiner sees them before getting into the substance of your work. For example, one PhD thesis had a four-page section in the Introduction on values. The candidate said, *inter alia,* that:

> From the key questions, some of which are directed toward certain aspects of perfect competition such as the extent of job knowledge and wage rates, it might be assumed that a normative role has been assigned to the concept of perfect competition ... It must be made quite clear, therefore, that the perfectly competitive market is not being used as a model of reality nor as a norm ... A labour market may be judged to be close to or remote from perfect competition without any value judgment that this is 'good' or 'bad'.

The reasons for topic selection are fairly easy to handle—you can always make a case that it is an important issue, but this leaves the question of important to whom? The preservation of industrial peace is important to employers; it is not always important to a particular union at a given point in time—or even generally, if the union operates in a continuous challenge frame of reference. So do not just say that your topic is important, say who it is important to and why, thus making your values explicit.

Another question is the reason for a particular **locale** for your research or the use of a specific data set. The reasons here are usually pragmatic, and there is nothing wrong with that. One piece of research was carried out on industrial relations in a particular organisation because the researcher had close personal contacts with its senior industrial officer and the secretary of the most important union concerned. This can be defended on the grounds that these personal relationships ensured access to documentation and was likely to result in honest opinions being elicited from the people concerned. Another reason was that the organisation was small enough (600) employees for the project to be tackled by a researcher with no financial assistance. Similarly, the publication of a new set of statistics by the ABS as a result of a new collection or survey may be the trigger for some research on that material. The data flowing from the Workplace Industrial Relations Project would be a classic case of this.

It is important for personal and political views not to interfere in the research process. One PhD examinee, a former ALP candidate for a local seat, had conducted numerous interviews with union officials. The topic necessitated the ascertaining of employer views, but he had not approached anyone on the employer side, presumably because of his deeply held values. They had not refused to see him, he had not even tried to contact them. The thesis was deferred until this fault had been remedied.

REFERENCES

Creigh, S.W. and Makeham, P. (1982) 'Strike incidence in industrial countries: An international perspective', in *Australian Bulletin of Labour 9,* pp.139-55.

Doucouliagos, C. (1991) 'Economic theories of the technical and social determinants of productivity', *Labour Economics and Productivity 3,* pp.87-101.

Dufty, N.F. (1981) 'Influences on public opinion of unions and industrial relations', *Journal of Industrial Relations 23,* pp.417-29.

_____ (1990) *Arbitration in Western Australia: The First 25 Years.* Industrial Relations Research Centre, University of NSW, Kensington.

Hibbs, D.A. (1978) 'On the political economy of long-run trends in strike activity', *British Journal of Political Science 8,* pp.153-75.

Lynd, R.S. (1945) *Knowledge for What?* Princeton University Press, Princeton.

Myrdal,G. (1942) *An American Dilemma,* Harper, New York.

Morison, S. (1936) *First Principles of Typography.* Cambridge University Press, Cambridge.

Nicholson, N, Ursell, G. and Blyton, P. (1981) *The Dynamics of White Collar Unionism.* Academic Press, London.

Spinrad, W. (1960) 'Correlates of trade union participation: A summary of the literature', in *American Sociological Review 25,* pp.240-51.

Wheildon, C. (n.d.) *Communicating or Just Making Pretty Shapes?* Newspaper Advertising Bureau of Australia, North Sydney.

Zappala, J. (1988) *Workplace Industrial Relations in Australia: An Annotated Bibliography* 1970-87. University of Sydney (CIRRUS) and BCA, Sydney.

Postscript: Agenda for Further Debate?

Some Australian Industrial Relations analysts have been asking questions about its future directions. In the context of this anthology, we could begin by enquiring how a closer concern with methods and methodology might assist Industrial Relations.

Arguably, the quest for 'grand theory' is not the way to enhance Industrial Relations—not yet. Given the cuckoos of other disciplines being nurtured in our nest, the search for 'grand theory' is inappropriate, at this time—if indeed it is necessary at all. As the range of approaches apparent in this volume, or the range of perspectives and methodologies evident in any Industrial Relations journal, demonstrates, plurality may well be an advantage, an unappreciated point of strength.

This is not to devalue the recent work of theoreticians in their attempts for 'grand theory'. There has been some invaluable work done. Rather, it is important for the exponents of Industrial Relations to be aware of the strengths that already exist. What has made Industrial Relations seemingly more vulnerable to attacks from all quarters in recent years has been a desire to make it conform to the methods of other disciplines, thus seeking to turn away from what is unique and valuable in Industrial Relations research.

It is arguably more important for us to be concerned to improve what is unique to Industrial Relations, rather than aiming to keep up with whatever other area of study is currently considered trendy. Historical, social, economic, and political factors have structured the nature of Industrial Relations as a discipline and as a practice. It can become better, and gain greater credence, by more rigorous efforts to build on the solid foundations already laid, rather than by facelifts or fundamental shifts in personality.

If these assumptions have weight, then a way forward is to seek 'good industrial relations'—not those sought by the harassed personnel manager, or national union officials, but rather good research practices and analysis. This requires focussed and purposive debate. Somewhere among all the performance appraisals, endless meetings, teaching or other professional commitments, and while fulfilling research 'dargs', it behoves Industrial Relations analysts to analyse more critically research methods and methodologies. Starting points for such investigation could well include some of the issues raised in this book.

At the outset, it was stated that the aim of the book was twofold. The primary aim was to provide a guide to methods and methodology in Industrial Relations research for the novice practitioner or researcher. The secondary aim was to refire some debates over the nature and forms of inquiry in Industrial Relations. The need for such debates is not to propose mere academic head-banging, but rather to recognise that a young and intensely pragmatic discipline must understand its own strengths if it is to remain valuable and viable.

As Dabscheck argues in Chapter 2, 'critical scrutiny' is the hallmark of rigorous investigation—'critical' in terms of thorough questioning, 'scrutiny' in terms of detailed examination. Just as these should be the underlying theme for the novice researcher, so too it is perhaps time that those within the discipline in Australia subjected Industrial Relations to further critical scrutiny. The issues covered in this book form the beginnings of an agenda for debate. It is not a complete agenda by any means, but questions large and small have been raised which deserve consideration and argument.

For example, there has been negligible purposive analysis of some of the epistemological issues in Industrial Relations in Australia. Gardner highlights the fact that for some researchers, method precedes epistemology, whereas Sutcliffe argues that the foundations for inquiry shape the forms of investigation. This is not simple 'chicken or the egg' patter—it raises the need to question what are frequently the 'taken-for-granted' assumptions. Related to this is Plowman's defence of 'descriptive research' as the basis for deeper research and which he argues plays a role in exploring that which might otherwise be taken for granted. What roles have the different forms of research played in enhancing the discipline as a whole, rather than merely fulfilling the immediate purposes for which the research was undertaken? Should there be any change in the basis, nature or direction of research?

This raises the more specific questions of future directions for research. How far should research be qualitative as against quantitative? Gardner notes in this book that the issue of qualitative versus quantitative is a 'vexed choice' for the beginning researcher. But Verrucci, and more particularly Callus and Whitfield, propound much greater use of quantitative methods. How far analysis should become more quantitative is indeed a vexed choice, but it is arguable that what weakens a discipline is the failure of its exponents to make any real choice at all. To make vexed choices, the scholar and the practitioner need to have a sufficient understanding of both sorts of techniques. In that way, making decisions regarding the best method for a particular project does indeed become a choice rather than a consequence of methodological rigidity or insufficient understanding.

Within the qualitative areas, Shanahan's strong case for the use of informal sources, and Brooks' emphasis on the law, suggest further research sources which may not have been used to best advantage by researchers. By gaining competency in all the methods available, research can become more apt and more rigorous, because choices, even if vexed, are available. The dynamic of

Industrial Relations deserves a plurality of means to understand it.

This fits with Ellem's argument for an ongoing literature review in a research project, rather than one undertaken early in the piece. It is based on his view of the research process as dialetic, as a dialogue between the researcher and the topic. As knowledge of a topic progresses, so too the questions asked will progress. In the same way, the progress of a discipline is a matter of dialectics, not a simple linear expansion of knowledge. Plowman calls it a jigsaw— 'in the end the pieces must all fit together', but not necessarily in a set order.

These issues raise further questions about how research methods are taught. What should be the content of research methods or research methodology courses? What emphasis should be placed on the methodological, as against the technical or procedural issues? Where does the communicating of findings fit into such teachings? In their very lively chapters, Brown and Dufty spell out the fundamentals of presentation of research findings. How far should these be learned like Topsy, who 'just growed', and how much should be taught? If taught, by what means? At a time when new researchers are faced with greater pressures than previously to produce research findings lucidly and quickly, who will teach them how to do so?

These are just a very few of the questions which have arisen from this book. Its undoubtedly more critical and discerning readers will have found many more. Such questions are fitting at a time when not only research itself is under attack, but also some Industrial Relations exponents see the discipline itself vulnerable. When the market rules supreme, Industrial Relations analysts should take heed—not by selling to the highest bidder, but by sterner investigation of its own properties.

These properties and qualities are myriad. They relate to the fact that Industrial Relations is a discipline not yet ossified by grand theories or rigid methods. Its most admired exponents come from a variety of ideological perspectives and use a range of methodological approaches to inquiry. The discipline has the capacity to build on these strengths. But more systematic debate is needed.

There is no doubt that Industrial Relations is a mongrel child of several parents—labour economics, industrial sociology, labour law, organisation psychology, labour history... But this does not make it merely a passing fashion, for clearly it has a unique place within the social sciences as that discipline which deals with the employment relationship and the institutions which seek to influence this core relationship. The thirteen substantive chapters in this book attest to the strength, as well as the plurality, of the discipline. They offer thoroughgoing expert advice on the bases and forms of inquiry into Industrial Relations. They also demonstrate the value of intellectual rigour—perhaps an unpopular trait in these times of the quick fix and anti-intellectualism. To attain intellectual rigour within a pluralist discipline which deals with complex economic and social relationships requires effective knowledge of its methods and methodology, and lively debates among its exponents. By such activity, the mongrel child can aspire to the legitimate place it deserves.

Appendix:
Glossary of Statistical Terms

Arithmetic mean—a measure of central tendency which is calculated by adding the values of all observations by the total number of observations.

Coefficient of determination—a measure of the amount of correlation between two variables. Typically termed R^2.

Coefficient of variation—typically used for the comparison of the dispersions of variables with different scales.

Descriptive statistics—techniques which are used to bring order to a body of data or to illustrate a point.

Discrete Regression Models—regression models which are used where the dependent variable is dichotomous or polychotomous.

Frequency distribution—a distribution showing the number or proportion of a given variable falling within a particular class.

Geometric mean—variant of the arithmetic mean which is typically used when analysing rates of growth.

Inferential statistics—statistical methods which are designed to generalise results drawn from a sample of the population.

Linear discriminant analysis—a technique for allocating observations to one group or another (others). Based on the linear probability model.

Linear probability model—extension of the multiple regression model to the case of a dichotomous dependent variable.

Logit analysis—a technique for estimating a qualitative choice model. Uses maximum likelihood techniques. Similar to probit analysis.

Mainframes—computers that can process large amounts of data.

Median—a measure of central tendency based on the middle value of a series of observations.

Method of least squares—a technique for measuring the degree of association between variables.

Mode—the most commonly occurring observation of a distribution.

Multiple regression—a technique for measuring the degree of association between three or more variables.

Non-parametric methods—statistical methods which are used where the underlying distributions are not normal and/or not cardinal.

Personal computers—computers of smaller capacity than mainframes.

Probit analysis—a technique for estimating a qualitative choice model. Uses maximum likelihood techniques. Similar to logit analysis.

Qualitative data—information which varies by kind rather than degree—for example, gender, occupation.

Quantitative data—information which varies by degree rather than kind; for example, income, age, size.

Quartile deviation—a measure of dispersion based on medians and quartiles.

Random Access Memory—the amount of working space available in a personal computer.

Range—the difference between the highest and lowest values in a series.

Simple regression—a technique for measuring the degree of association between two variables.

Standard deviation—a measure of dispersion which is based on deviations from the mean. It is the square root of the variance.

ACIRRT

The Australian Centre for Industrial Relations Research and Teaching (ACIRRT) at the University of Sydney was established as a Key Centre of Teaching and Research in 1989 through a grant from the Commonwealth Department of Employment, Education and Training. The Centre is closely linked with the University's Department of Industrial Relations, which has a long and distinguished history of teaching and research in this area.

ACIRRT's main brief is to improve the quality of industrial relations teaching and research in Australia. This goal is being pursued through a range of activities including seminars and research projects conducted by members of ACIRRT and scholars from other institutions, secondments of staff, and publications.

UPS PRINTED BY THE UNIVERSITY PRINTING SERVICE