M e d i c a l   S t u d e n t s :

Origins, Selection, Attitudes and Culture

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<u>Abstract.</u>

The attitudes of medical students to ethical problems are the principle subject of this thesis, those attitudes being likely to affect subsequent clinical practice. Two empirical studies have examined the effects of selection upon attitudes and the development of ethical attitudes during the undergraduate years. In so doing both studies have *necessarily* broadened, to ask many other questions about medical students, without which a study of ethical attitudes would be inconclusive. The St. Mary's study was a prospective investigation of medical student selection during 1980-81. Questions were asked about bias in selection (both at St. Mary's and overall), and about the process of selection itself, concentrating particularly on short-listing and interviewing. In addition comments of the applicants were carefully examined, and recommendations made for improving selection. The Birmingham study was a cross-sequential study of medical students over the years 1977-1981, transverse studies of the five undergraduate years taking place in 1977 and 1981, and the entry cohorts of the years 1977-1980 being followed up in 1981. Five major factors were examined in relation to the ethical attitudes of medical students. <u>Selection </u>was shown to have almost no influence upon the attitudes held by students. <u>Maturation </u>and <u>Medical training </u>were shown to have effects that could be discriminated by statistical analysis, maturation having the larger and more general effects, whilst medical training tended to affect specifically medical issues. <u>Cultural interests </u>were measured on a newly developed scale, and were found to have moderate correlations with attitudes. <u>Religion </u>was of major importance in determining attitudes. Causal analysis, by examining cross-lagged panel correlations, suggested that religion determined attitudes, whereas attitudes themselves determined cultural interests.

For my parents,

without whom I **would never** have studied medicine,

and for Diana,

without whom I would never have studied medical students.

"Much to cast down, much to build, much to restore;

Let the work not delay, time and the arm not waste;

Let the clay be dug from the pit, let the saw cut the stone,

Let the fire not be quenched in the forge".

                              T.S. Eliot, The Rock.

<u>Medical Students:</u> Origin, selection <u>attitudes</u> and <u>culture.</u>

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Figures and tables, which are numbered in the decimal system, are placed at the end of each chapter.

Figures.

<u>Acknowledgements.</u>

In preparing as complex and extended a work as a thesis, there are many people who deserve particular thanks for their help, discussion and encouragement. The first questionnaire study of medical students in Birmingham in 1974 was the <u>fons et origo</u> of the present studies, and would not have taken place without the influence, interest and help of Drs. Tony Daniels and Kennedy Cruickshank. Dr. Diana Lockwood gave the ever-present driving force which encouraged me to extend that first study into what became 'the Birmingham study': many of the questions were written jointly with her, the majority being thrashed out one holiday in the coffee-houses of Syria; and without her organisational flair and dedication the logistics of a five-year prospective study would have been formidable. Dr. Nick Isbister's interest prompted extension of the work into 'the Cambridge study'. Prof. Peter Richards provided the final piece in the jigsaw when, after reading, in the medical student magazine of another university, a critical article of mine with the unprepossessing title of 'Unnatural Selection', he had the memory to realise that the author was one of his newly-appointed staff, and he had the imagination and courage to ask me to carry out what has become 'the St. Mary's study'. My debt to him is immense. He has given me as free a rein as I could possibly wish, and he has at all times reacted with total intellectual integrity and objectivity to the findings of research which might well have been regarded by others as the educational equivalent of the psychoanalyst's couch. In addition he has ticked some tens of thousands of boxes on my questionnaires, a labour which I hope he still regards as worthwhile. Finally I must thank him for his continual encouragement in the whole project.

Chapters 2 to 6 were written by myself in their first drafts, and were then criticised and amended by Prof. P. Richards. The first draft of chapter 7 was written by Prof. P. Richards and subsequently extended and modified by me. Shortened versions of chapters 2 to 7 have been published jointly with Prof. Richards in the <u>British Medical Journal </u>(McManus and Richards, 1984a,b,c) and an additional analysis of the data has been published in McManus and Richards, 1985. Chapters 7 to 13 have not been published as yet, although Drs. D.N.J. Lockwood and J.N. Isbister will be joint authors when they are so; as those chapters stand in this thesis they have been written entirely by me. Chapters 1 and 14 are entirely my

own work. Of course all opinions are attributable only to myself, and errors of fact are entirely my responsibility.

1: Ethics. practice, selection and training.

"every consultation has an ethical component"

Bradley (1983).

"To decide what type of treatment to prescribe a physician must weight factors of different types: in particular, facts and values."

Hill (1979; p.254)

"...it is crucial to any understanding of clinical judgement to see it as involving an ethical dimension"

Scriven (1979; p.14)

"Medical education today places too little emphasis on the ethical aspects of medicine..."

McIntyre and Popper (1983; p.1922)

"In practising medicine doctors routinely make decisions... Some, but only some, of these decisions are matters of technical skill. I submit that the majority of decisions taken by doctors are not technical. They are, instead, moral and ethical."

Kennedy (1981; pp76 and 78).

The choice of what action to recommend involves more questions of value ... than diagnosis. The closer we come to the end of the process of clinical judgement - the right action - the less useful and available is the scientific model. The reasoning at this stage is mainly dialectical, ethical and rhetorical."

Pellegrino (1979a; pp. 179 and 181).

Summary.

An overview of the thesis is presented, discussing the role of ethical attitudes in determining medical practice. A brief account of the three empirical studies is also given.

The practice of medicine involves a continual stream of decisions; some trivial, others literally vital; some technical, others ethical. It is ethical decisions which form the broad canvas of this thesis, ethics being taken in the widest sense as concerned with problems of assessing 'right action' for which purely technical answers are either not in principle possible, or perhaps are simply not technically possible at present; in either case decisions still have to be made, even if the result is only an act of omission rather than commission by simply deciding either not to act or not to make an explicit decision. As Sartre has put it, "He who decides not to decide has in fact decided" (Goldenring, 1983). Such ethical decisions are important in medicine, are liable to become ever more important as technical advances occur (as for instance has been shown in the field of <u>in vitro</u> fertilisation), and are liable to become of increasing interest and concern to the public at large, and to governments (as evidenced by the creation of such groups as the President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioural Research (Abram and Wolf, 1984), and the

Warnock Committee (Anon, 1984a)). Furthermore the problems will be accentuated rather than diminished by the use of statistical decision analysis (see Brett, 1981), and are generally completely ignored by studies of 'clinical problem solving' (e.g. Kassirer and Gorry, 1978; Elstein, 1976; Elstein et al, 1978). The manner in which ethical decisions are made by doctors is also of growing interest to the ever-increasing group of professional 'doctor-watchers' (Jonsen, 1983).

That doctors disagree as to how ethical decisions should be made is a trivial observation (although the eloquent paper of Blinker, 1983, and its associated correspondence will provide an example, should it be

needed). How to explain and understand those disagreements is a far more complex problem; and melding the multitudinous attitudes and positions into a single coherent and generally acceptable set of professional policies is almost impossible, as is well illustrated by the almost totally bland nature of such works as the British Medical Association's Handbook of Medical Ethics (British Medical Association, 1980).

The present thesis has two themes, which are well reflected in the title of a paper by Alison Munro, once ahead-mistress and then Chairman of a London Teaching Area Health Authority, in which she asks, "The wrong doctors: selection or training at fault?" (Munro, 1981). By "wrong" it is taken to mean the same as Jason (1978) when he said, "There is considerable dispute [whether] ... the capacity for self-initiated, independent learning [,]... effectiveness in establishing trust-based, empathic relationships [,]... and the ability to identify and solve complex clinical problems ... are present among current physicians to the extent that society deserves"; and it is assumed that these deficits are, in part, attitudinal, although technical incompetence and simple ignorance may also contribute. The two parts of Munro's question suggest that such problems arise either because the wrong students were selected in the first place (i.e. that attitudes are brought with the student when he arrives at the school), or are the direct consequence of medical training (i.e. the attitudes are bought at the school). The two positions may be likened to the nature-nurture controversy which has riven so much of biology, nurture in this case being seen as commencing at the age of admission to medical school. Part I of this thesis examines in detail the generally neglected question of how medical students are selected. As well as considering the specific question of whether acceptances differ from rejects in the ethical attitudes that they hold, the study also considers the questions of whether there are

factors in selection such as social class, schooling, etc., which have an indirect influence on the attitudes of students, and it places these questions in the broader context of asking how the process of selection occurs; Who applies for medical school; How are they short-listed for interview; How are they selected at interview; Is the process generally fair; and, finally, How can the process of selection be improved? Unless the process of selection itself is well understood then conclusions to its effects cannot be drawn. Munro is not unique in suggesting the need for change in selection, in its relation to attitudes, although Ewan and Bennet (1981) have disputed that position. In an influential review, Rezler (1974; p.1029) concluded that,

> "attitudes are indeed highly resistant to change ... [H]ow can medical schools ever hope to deve lop new professional attitudes? The answer lies in selecting students who possess certain attitudes prior to entrance, attitudes that the medical profession considers important, instead of trying to develop such attitudes in students after they enter medical school"

and her conclusions were later echoed by a Lancet editorial (Anon, 1975).

Likewise, an editorial in Medical Education concluded that;

> "Not all the qualities needed by doctors can be instilled by medical training; and some of those necessary attributes, particularly attitudes and values, will be more or less evident when appropriate scrutiny is made with technically sound selection methods" (Anon, 1979a, p.78)

Empirical support for that position is provided by Shuval (1980; p.115) who found that post-intern attitudes were about as well predicted by pre-entry attitudes as by pre-intern attitudes, suggesting relatively little overall change during the clinical years, although Shuval herself does not agree with that interpretation (p.217).

Part II of the thesis considers how students change as they pass through medical school. Once again the theme uniting these studies is the understanding of how ethical attitudes develop and change, but necessarily other issues arise in answering these questions. How much

can change be attributed to medical schooling <u>per se</u>, and haw much to the concomitant ageing and maturation of students as they pass through medical school? Finally, do factors such as the religious views and the cultural interests of students affect their attitudes, both factors traditionally being linked to ethical attitudes through causal mechanisms in a number of ways. In particular, if there are <u>correlates </u>between, say, religion and attitudes, what is the direction of <u>causation? </u>Do changes in religious views cause subsequent changes in ethical attitudes, or is it rather that changes in ethical attitudes cause subsequent change in religious views? The method of cross-lagged panel correlations will be used to provide answers to such questions. Chapter 13 is the focal point of Part II, and the other chapters may be seen as converging on the issues raised in that chapter, providing the necessary tools and background analyses. The reader may do well to start Part II by reading chapter 13, then reading chapters 8 to 12, and then finally re-reading chapter 13.

Together it is hoped that Parts I and II, as well as providing what Kemp (1968) has called an "ecology of medical students", will begin to answer the questions raised by Munro (1981), in so far as they account for the differences in attitudes found between medical students. Two further assumptions will be necessary before differences between <u>doctors</u> can be explained. Firstly it must be shown that the attitudes of students correlate with the subsequent attitudes and behaviour of those students a number of years later when they become mature, practising doctors. There are, to my knowledge, simply no empirical prospective studies to justify that assumption, and at present it must simply be taken as a reasonable article of faith which would would seem to be well-supported by informal observation. The second assumption which must be supported is that the ethical attitudes of doctors actually matter,

and have a genuine effect in determining their practice, and the decisions they make in that practice. Such an assumption seems implicit in the continuing publication of studies on the attitudes of doctors and other personnel in the health professions. Table 1.1 lists the number of English-language references in Index Medicus under the heading 'Attitude of Health Personnel', over the 10-year period, 1974 - 1983. An average of 171 papers per year suggests that such attitudes are strongly felt to be relevant and important, at least by the researchers themselves. Similarly the continuing publishing success of the Journal of Medical Ethics emphasises the concern felt by doctors over ethical problems. And outside of medicine itself, there is a ready assumption of the relevance of attitudes to practice, reflected in the popular media (e.g. Gathorne-Hardy, 1984), in medical sociology (e.g Carlton, 1978; Bennett, 1979, p.175; Hauser, 1981, p.121), and in academic philosophy, which has seen a renaissance of interest in ethics in relation to medical problems (e.g. Bloch and Chodoff, 1981; Bok, 1978; Frey, 1983; Glover, 1977; Nagel, 1979; and Singer 1979).

A number of more concrete examples will help to emphasise the role of ethical attitudes in medical practice. A recent example concerns selection of patients in end-stage renal failure for dialysis and transplantation. The United Kingdom has one of the lowest rates of dialysis and transplantation in Europe. Analysis of the attitudes of nephrologists, general physicians, and general practitioners to active treatment in a series of hypothetical patients shows that many patients are not treated despite being acceptable to nephrologists, because GPs and physicians will not refer them. This 'negative selection' depends primarily on criteria of who 'should' be treated, rather than who 'could' be treated (Challah et al, 1984). Such decisions are almost entirely ethical rather than technical, and involve assessments of the worth of

Lire, the worth or an individual, and the global cost of treatment to society, all of which are not primarily medical judgments; they are ethical.

Mechanic (1979; p.185) has suggested that "...physicians' political views are highly correlated with how they view the organisation and delivery of medical care", and as an example he quotes, amongst others, his own study of general practitioners (Mechanic, 1975). The attitudes and values of 772 GPs in England and Wales were assessed in relation to their 'social orientation', those with a high social orientation feeling that medicine should involve itself in a wide-range of everyday problems of patients. Doctors were also categorised in terms of their scientific orientation, by analysing their use of 19 diagnostic procedures over a two-week period. The combination of scientific orientation and attitudes related to a wide-range of other measures of the manner of practice of the doctors. Mechanic (1974) also found that the receptivity of American primary-care physicians to organisational change in their practices related to their political attitudes. A similar result was found by Goldman (1974), although Toone et al (1979) could find no relation between political attitudes and psychiatrists' models of mental illness.

A British Medical Journal editorial reviewed the work of Pallis and Stoffelmayer (1973), which showed correlations between the political and social attitudes of psychiatrists and their preference for physical treatments, and concluded that "...psychiatrists should be aware of associations between their social attitudes and the treatments they use. Disagreements ... between psychiatrists about efficacy of various forms of treatment are not based on reason alone. They stem in part at least from deeper roots. Might not inquiries of this kind describe [similar effects] among surgeons, or among general practitioners ...?" (Anon,

1973).

A study in which attitudinal effects are implicit but not explicitly studied, is that of Howie (1976). 593 general practitioners returned a questionnaire in which they were given a brief case history and a photograph of a sore—throat, and asked whether they would prescribe antibiotics. In 7 of the 12 cases the decision was dependent on the social circumstances of the case (the photographs being constant). For instance 16% of the GPs would administer an antibiotic to the "Son (aged 12) of the newly appointed district medical officer" whereas 24% would give an antibiotic to the "Son (aged 12) of the newly appointed hospital consultant surgeon" (difference $p<.05$). Clearly therapy here is dependent upon social attitudes. Another example of implicit attitudes affecting treatment is the study of Bedell and Delbanco (1984) of cardio—pulmonary resuscitation (CPR) in an American hospital; "our study suggests that physicians frequently form opinions about a patient's attitude toward CPR ... These attitudes and behaviours appear to be independent of the physician's estimates of the probability of arrest, the location of the patient in the hospital, or the patient's underlying disease" (p.1091). The attitudes are clearly shown to affect what the patient is told, and often conflicted with the patient's own wishes concerning CPR. The determinants of these attitudes, which to large extent are ethical, are not clear.

Another study in which attitudes are important is in the success of the consultation as a form of communication; as Walton et al (1978) put it, "The doctor's attitude ... is one factor that has been clearly shown to affect compliance and understanding" (p.27). Rezler and Haken (1984) suggested that "lack of access to doctors, hurried visits, inadequate information, missed psycho—social problems, and the high cost of medical

care are frequent complaints voiced by patients [which] ...   have their roots in the doctor's attitudes." (p.331).

One of the earliest and most cited quantitative studies of the ethical attitudes of doctors is that of Oken (1966), who asked 219 physicians in a Chicago teaching hospital whether they would tell a patient that they had cancer; some 88% said that they would not. Quite clearly the attitude here must influence practice itself. The doctors' attitudes have been contrasted with those of patients, Weir (1979) placing the Oken paper alongside the survey of Kelly and Friesen (1950), in which it was shown that about 90% of patients, both those with and without cancer, would want to be told the nature of their disease. (in fairness it must be said that the attitudes of both oncologists and doctors in general have now changed substantially, a vast majority being in favour of telling the diagnosis; Greenwald and Nevitt, 1982; Novack et al, 1979). Oken (1966) concluded his influential paper by stating that, "our personalities, feelings and attitudes play a major role in determining the manner in which we communicate with and treat patients".

Hoffman (1958) reported an unusual and important survey which examined 89 American general practitioners to assess their ability as doctors, simply entitling the paper, "How do good doctors get that way?". The important negative results were that quality of care did not relate to background factors such as father's occupation, score on the MCAT (Medical College Admission Test), patient load, etc.. Instead the best correlates were variables which were far more under the active cognitive control of the physicians: the amount of post-graduate study; subscription to medical journals; membership of the American Academy of General Practice; having a well-equipped office, and having an appointments system. The implication is that those variables which

probably best reflect the <u>attitudes</u> of the doctors to their practice are also the best <u>predicters</u> of their ability in that practice. The same finding is reported in the unusual study of Coleman et al (1966) in which they observed the response of a group of doctors to the introduction of a new drug, given the pseudonym ˉgammanym. They found a number of correlates of rapid use of the new drug in practice, and they state:

> "The factors examined up to this point have been external characteristics of the data: speciality, background, attendance at meetings, readership of journals, and so on. But implicit in many of these external characteristics are internal attributes: certain orientations to medicine, and <u>indeed to life generally"</u> (p.183, my emphasis).

Once more the implication is that attitudes in the broadest sense are important in determining the details of practice.

An unusually sophisticated study of attitudes is that of Link et al (1982). They investigated the attitudes of Israeli GPs towards psychiatry, finding four independent attitudinal dimensions; I: Belief in Psychogenesis, II: Psychiatric Fatalism, III: Referral reluctance, and IV: GP as caregiver. When they examined the behaviour of the GPs in their practice they found that factors I and III predicted the likelihood of GPs <u>identifying</u> patients as possible psychiatric cases, but did not relate to the probability of a case being <u>referred</u> to a consultant psychiatrist, once the case had been identified by the GP. The effects of the attitudes are therefore clearly demarcated and circumscribed, suggesting that they might not have the universal import suggested by some authorities.

Despite the suggestions of the above studies that attitudes are important in determining practice, it must be said that there is an embarassing dearth of studies in general which examine <u>causes</u> of <u>variation between doctors</u> in the <u>way</u> in <u>which they practice.</u> In the sociological literature the tendency is to examine a merely stereotyped

figure, 'the doctor', with little emphasis on differences, many of the studies being observational and qualitative rather than quantitative and assessing hypotheses (e.g. Rosser and Maguire, 1982). In the medical literature it has come to be accepted that doctors indeed differ in ability, or in personality, and in their practice (e.g. Marks and Hillier, 1983 as a single random example), but this is usually just accepted as a fact of nature, with no attempt being made to explain or understand such variation in relation to differences between the doctors themselves e.g. in studying their communicative abilities (Byrne and Long, 1976). Even if attempts are made they are usually in terms of what Coleman et al would call 'external characteristics', rather than of the internal characteristics which reflect the personality of the doctors concerned. A good example of this is the much-praised studies of British general practitioners by Ann Cartwright (Cartwright, 1967; Cartwright and Anderson, 1981). Each study contains a chapter on "Variations between doctors", and in each case is almost totally concerned with differences in external characteristics; age, sex, etc.. In the present thesis I would argue that it is prima facie highly likely that differences in personality and attitudes of doctors are of interest and importance, and that such differences should be investigated, if for nothing else but to show the negative result that they are actually not of the importance that common-sense and intuition would suggest them to be.

The empirical studies.

    The data for the present thesis are derived from three separate empirical studies, two of which, the Birmingham Study and the St. Mary's Study, will be analysed in some detail, and the third, the Cambridge Study will be used only to provide extra subjects for the factor analytic

sections of chapters 8 and 10. The St. Mary's study alone is used to investigate the process of student selection, while both the St. Mary's and Birmingham studies are used to study attitude change during the period at medical school, the Birmingham study being used to study attitudes in all years at medical school, both transversely and longitudinally, and the St. Mary's study being used to assess the importance of background factors.

For convenience a brief account of the structure of the three studies will be given here, and the full versions of the questionnaires may be found in appendices to this chapter. The St. Mary's study will necessarily be described in far greater detail in chapter 2.

The <u>St. Mary's Study.</u> All persons were studied who applied through UCCA (the Universities' Central Council on Admissions) during September to December 1980 for admission to St. Mary's Hospital Medical School in October 1981. Those with non-British addresses for correspondence were omitted from the study proper on the grounds of logistic convenience, although their final destinations were observed. All those in the full study (i.e. with British addresses) were sent questionnaire Q1 (see appendix 1-1) by post as soon as possible after receipt of the UCCA form, and were asked to return it in a stamped addressed envelope that was provided. All applicants who presented for interview were asked to complete a second questionnaire, Q2 (see appendix 1-2), on their arrival at St. Mary's for interview. The Dean completed a proforma on each application at the time of reading the UCCA form (see appendix 1-3), and each interviewer also completed a proforma on each interviewee (see appendix 1-4). The author examined all UCCA forms to extract statistical information, and UCCA provided information on the final destination of each applicant in October 1981. The A-level examining boards provided

information on A-levels obtained by applicants subsequent to their application to UCCA.

The <u>Birmingham Study.</u> This was carried out during the period October 1977 to October 1981 at the Medical School of the University of Birmingham, and was the successor to a preliminary study carried out there during February 1974. A single questionnaire was used (see appendix 1-5), which was distributed in individually addressed envelopes to all 1st, 2nd, 3rd, 4th and 5th year medical students on the first day of term in October 1977. Subsequently the same questionnaire was distributed to all new 1st year entrants to the medical school in October 1978, 1979 and 1980. In October 1981 the questionnaire was once more distributed to students in all five years of the medical school, including the new intake of that year. Figure 1-1 summarises the structure of the study in relation to the year of study in the medical school, the calendar year, and the cohort of entry of students to the medical school. The mean response rate in the thirteen 'year-groups' tested was 48.4% (SD 13.7%) with a range of 70.0% to 26.9%, the latter value coming from one of the final year groups, who are the most difficult to contact. In general response rates were highest in the five first-year groups (mean = 61.9%; SD = 7.5%). Several points must be emphasised about the design: i. There are two transverse studies, one in 1977 and one in 1981, and hence cohort effects may be distinguished from year of study effects. ii. The study is partly longitudinal in that those in the 1981 transverse study were also studied as new entrants over the period 1977 to 1980, some one to four years earlier. The design therefore allows both cohort and year of study effects to be distinguished, and also, since it is partly longitudinal, allows causal influences to be determined by examining the same individuals at

different times.

The Cambridge Study. This study examined a group of freshman medical students reading medicine at the University of Cambridge in October 1977. No follow-up of these students has been attempted. The questionnaire used was almost identical to that of the Birmingham study, except where minor changes were made on the first two pages to take account of local differences from Birmingham. The questionnaire may be found in appendix 1-6.

<u>**Figure 1-1.**</u> Shows the structure of the Birmingham study of medical student attitudes. The abscissa shows calendar years, and the ordinate shows years in the medical school. Single cohorts are represented by oblique lines, and the groups actually studied are shown as large solid points and lines. The large squares indicate the 1977 transverse study, the large triangles the 1981 transverse study, and the large circles the entrants during 1978-1980.

The Birmingham Study 1977-81

Cohort: '73   '74   '75   '76   '77

Year in
school
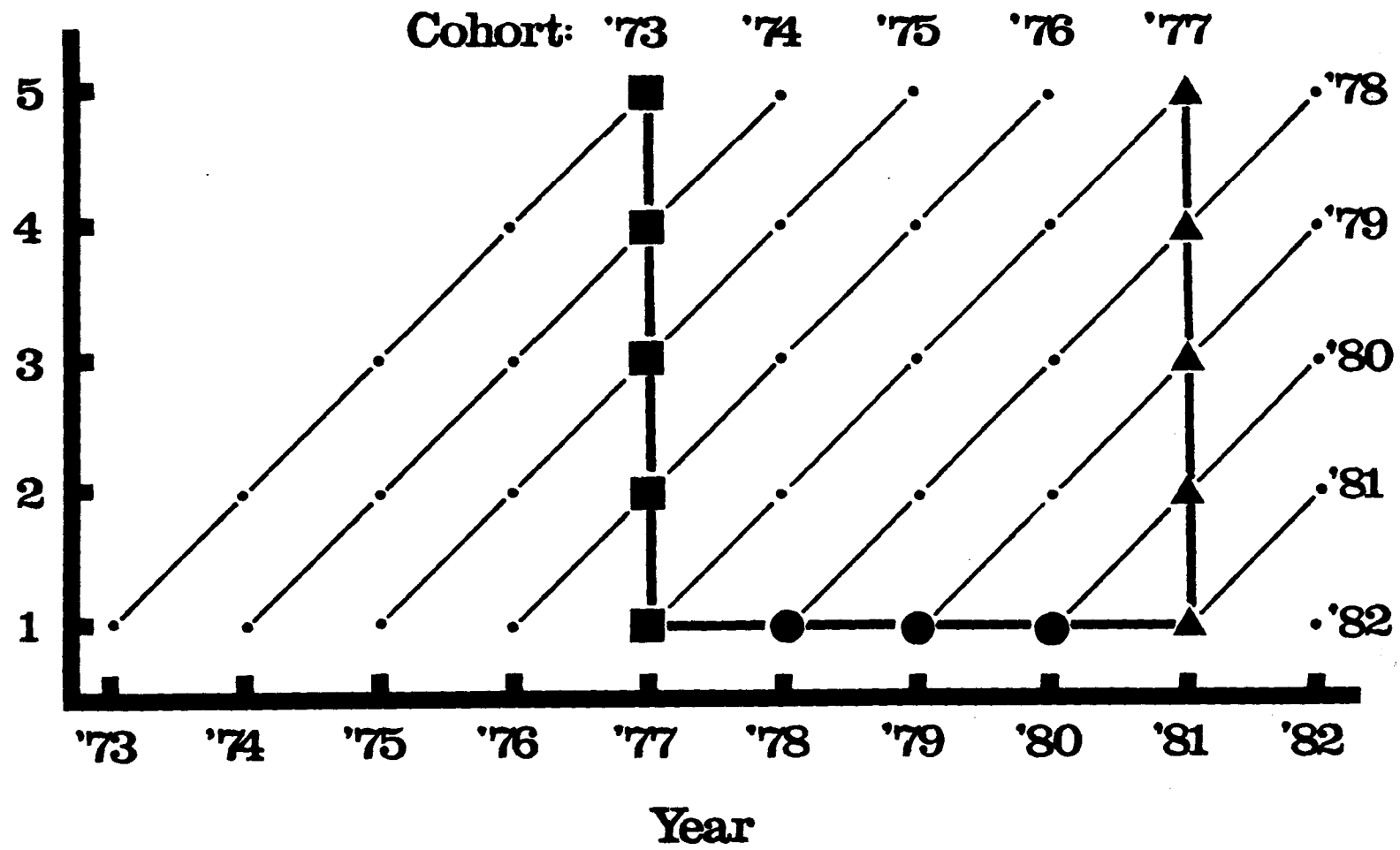
Year

**Table 1-1: Yearly references to 'Attitudes of Health Personnel'
in Index Medicus for the years 1974 - 1983 (English language only).**

Year	References.	
1974	144	4
1975	201	0
1976	176	X
1977	207	
1978	168	
1979	176	X
1980	145	
1981	169	
1982	138	
1983	188	
Total	1712	

St. Mary's study: Questionnaire 1.

St Mary's Hospital
Medical School

Norfolk Place London W2 1PG 01-723 1252

Dean: Professor Peter Richards, MA,
MD, PhD, FRCP.

Secretary: **K. Lockyer, BA.**

Dear Applicant,

We have recently received notice from UCCA that you have placed St. Mary's Hospital Medical School on your UCCA application form. That application is being considered at present, and you will hear further about it either from the Dean, or from UCCA.

At St. Mary's we are interested in who is applying to study medicine and in how our selection process works. We are therefore carrying out a research project and would be grateful if you would help us in this by completing and returning the enclosed questionnaire. This questionnaire is <u>entirely</u> for the purposes of research, and its contents will not be known to those who are actually carrying out the selection of students. Please therefore answer as truthfully as possible in the knowledge that none of the information given will affect the selection process at all. Naturally all information given will be treated in the strictest of confidence and will be used <u>for educational research only.</u>

This research project was instigated by the Dean of St. Mary's and has his complete approval; however, none of the information will be made available to him until the selection process is completely finished, and then only for the purposes of research. I should also add that I myself am not involved at all in the selection of medical students.

Since this questionnaire is not a part of the official selection process its completion is not a <u>necessary</u> part of your application, and if you are opposed to completing it, this is a matter for you. Alternatively, if you do not wish to answer certain questions, please leave them blank and return the rest of the questionnaire. Since the study does have the approval of the Medical School I would however be most grateful if you could take the trouble to complete end return the questionnaire as soon as possible, in the enclosed stamped addressed envelope.

My thanks in advance for your cooperation

3

I.C. McManus, MA, MB, ChB, PhD.
Lecturer in Psychology as Applied to Medicine

:. Mary's Hospital Medical School

S1̃5̃.̃

1search questionnaire for applicants for admission

day's Date ____ / ____ / 19 ____   2. Date of Birth ____ / ____ / 19 ____

11 name of candidate (Block Capitals)

_____

ne Address _____

_____

untry of Citizenship _____

< (Please ring the appropriate reply)   Male/Female

:ital Status (tick the appropriate category)

Single (not engaged to be married within the next twelve months) _____
Single (engaged and contemplating marriage within the next
twelve months) ... ...   _____
Married without children ... ...   _____
Married with children (If so, how many?)   ... ...   _____
Divorced ... ...   _____
Widowed   ... ...   _____

residents of the U.K. only:

which county or borough is your permanent home? _____

which of the following have you spent at least half of your life so far?
ck the appropriate category)

Isolated rural area/s   ... ...   _____
Village/s ... ...   _____
Small town/s (pop. under 50,000) ... ...   _____
Large town/s (pop. 50,000 - 250,000) ... ...   _____
Cities/Conurbations (pop. 250,000 and over) ... ...   _____

you have not yet left school:-

When do you intend to leave school? _____ month _____ year

you have left school:-

When did you leave school?   _____ month _____ year

which of the following types of school have you received your secondary
cation? Please tick the appropriate one. If you have been in more than
type please indicate the number of years in each.

Comprehensive ... ...   _____
Grammar School   ... ...   _____
Grant-aided School ... ...   _____
Independent Public School   ... ...   _____
Private School ... ...   _____
Secondary Modern School ... ...   _____
Sixth Form College ... ...   _____

ing your secondary education did you spend one or more years as a boarder?
ck yes or no)

If you have taken, or are going to take, British 'A' level examinations please give the subjects, board, date taken (or to be taken), and grades obtained. If you have not yet taken an A-level grade please indicate the grade that you <u>hope</u> to obtain. If you are taking resits, please indicate both grade obtained, and grade expected to obtain.

	Subject	Board	Date	Grade obtained	Grade expect to obtain
1.					
2.					
3.					
4.					
5.					

Have you already obtained a University degree in any subject? No/Yes
If Yes, what division honours did you obtain?

First / Upper Second / Lower Second / Third / Pass

What degree and subject? _____

Do you already have some professional qualification, other than a University degree? No/Yes
If <u>yes</u>, what qualification? _____

Whether or not you have left school:-

17. When do you intend to enter university? _____ month _____ year

18. Do you intend or are you having a "year" off between school and University? No/Yes

19. Would you recommend to others that they should have a year or so off between school and university?

   Definitely No / Probably No / Probably Yes / Definitely Yes

Have you applied to UCCA before? No/Yes
If <u>yes</u>, please give details.

What is or was your father's occupation?
(Describe what he does or did as fully as you can) _____

The following are The Registrar-General's Occupational Groups. Classify your father's occupation as precisely as you can into one of these groups (tick the appropriate category)

   a) Socio-economic Group I: Professional, etc. Occupations,
      e.g. University teachers, higher executives, company
      directors, lawyers, etc. ... ... _____
   b) Socio-economic Group II: Intermediate occupations
      e.g. teachers, journalists, authors, civil service
      administrative officers, pilots, managers, technicians,
      musicians, etc. ... ... _____
   c) Socio-economic Group III: Skilled occupations,
      e.g. accounting and costing clerks, craftsmen, foremen,
      shopkeepers, mine-workers, and other skilled workmen, etc. _____
   d) Socio-economic Group IV: Semi-skilled occupations,
      e.g. postmen and telephone operators, agricultural
      workers, etc. ... ... _____
   e) Socio-economic Group V: Unskilled occupations,
      e.g. building and dock labourers, etc. ... ... _____
   f) Armed forces ... ... _____
   g) Cannot classify ... ... _____

ipriate category (ies))

. a) A Higher Education?

   University ... ... _____

   Other professional training without university

   education ... ... _____

b) A Secondary Education?

   Public School ... ... _____

   Grammar School ... ... _____

   Ordinary secondary ... ... _____

c) An Elementary Education?

   Private Preparatory School ... ... _____

   Ordinary elementary school ... ... _____

Do not know ... ... _____

`8 | | | | | |` `0 3`

`| | | |`

ase indicate for each group of relatives shown below, whether any are, or
e, members of, or training for, the following professions, or jobs.

	Mother	Father	Uncles or Aunts	Grand-parents	Siblings	Cousins	Spouse	
ctor - Hospital								16
- GP								
- Other								26
rsing								
ysiotherapy								36
diotherapy								
cupational Therapy								46
inical Psychologists								
atitians								56
spital ninistration								
er Hospital Work								66
lical Social Work								
lical Secretary/ eptionist								76

either of your parents is medically qualified, which medical schools did
y go to?

   Mother _____

   Father _____

`8 | | | | |` `0 4`

many siblings (brothers and sisters) have you? _____

Please indicate, in the following table, separately for each sibling,
their age, sex and whether they are a medical student or doctor.

Sibling Number	Sex	Age (years)	Medical Student/Doctor
1.			
2.			
3.			
4.			
5.			
6.			

`| | | 10`
`| | | 14`

`| | | 18`
`| | | 38`

Do you think that medical schools automatically reject candidates who put them in fourth or fifth place?

All of them / Most of them / A few of them / None of them

How many of the medical schools that you have chosen have you actually visited?   0   1   2   3   4   5

How many of your chosen medical schools are on your list because of:

   i.   recommendations from students there at present?   0   1   2   3   4   5

  ii.   recommendations from your school?   0   1   2   3   4   5

 iii.   recommendations from doctors who trained there?   0   1   2   3   4   5

  iv.   their nearness to your parental home?   0   1   2   3   4   5

   v.   their farness from your parental home?   0   1   2   3   4   5

  vi.   their prospectus?   0   1   2   3   4   5

How important to you in choosing to apply to St. Mary's was the medical school prospectus?

Very important / Fairly important / Slight importance / Unimportant

Would you like to be able to live at home whilst carrying out your pre-clinical training?

Definitely Yes / Probably Yes / Probably No / Definitely No

How important to you is the particular order of medical school preference on your UCCA application?

It represents a clear order of preference for me /

It is moderately important / It is not very important /

It is almost in 'chance' order

How old were you when you first had the idea that you would like to become a doctor? _____ years

How old were you when you definitely decided that you would like to become a doctor? _____ years

How much did the following people or things encourage or discourage you in applying to study medicine?

	Strongly encouraged	Moderately encouraged	Not much influence	Moderately discouraged	Strongly discouraged
Your parents					
Your school teachers					
Reading books					
Watching television or films or listening to the radio					
Reading newspapers					
Your own general practitioner					
School friends or close colleagues					
People already studying at medical school					

your father had: (tick the appropriate category (ies))

a) A Higher Education?
       University ... ... _____
       Other professional training without university
       education ... ... _____
b) A Secondary Education?
       Public School ... ... _____
       Grammar School ... ... _____
       Ordinary secondary ... ... _____
c) An Elementary Education?
       Private Preparatory School ... ... _____
       Ordinary elementary school ... ... _____
Do not know ... ... _____

...ase indicate for each group of relatives shown below, whether any are, or
..., members of, or training for, the following professions, or jobs.

	Mother	Father	Uncles or Aunts	Grand-parents	Siblings	Cousins	Spouse
:tor - Hospital							
- GP							
- Other							
·sing							
siotherapy							
iotherapy							
upational Therapy							
nical Psychologists							
titians							
pital inistration							
er Hospital Work							
ical Social Work							
ical Secretary/ aptionist							

...either of your parents is medically qualified, which medical schools did
... go to?
       Mother _____
       Father _____

...many siblings (brothers and sisters) have you? _____

Please indicate, in the following table, separately for each sibling,
their age, sex and whether they are a medical student or doctor.

Sibling Number	Sex	Age (years)	Medical Student/Doctor
1.			
2.			
3.			
4.			
5.			
6.			

)o you think that medical schools automatically reject candidates who put
:hem in fourth or fifth place?

All of them / Most of them / A few of them / None of them

low many of the medical schools that you have chosen have you actually
'isited? 0 1 2 3 4 5

low many of your chosen medical schools are on your list because of:

   i.   recommendations from students there at present? 0 1 2 3 4 5

  ii. recommendations from your school? 0 1 2 3 4 5

 iii. recommendations from doctors who trained there? 0 1 2 3 4 5

  iv. their nearness to your parental home? 0 1 2 3 4 5

   v. their farness from your parental home? 0 1 2 3 4 5

  vi. their prospectus? 0 1 2 3 4 5

ow important to you in choosing to apply to St. Mary's was the medical
chool prospectus?

Very important / Fairly important / Slight importance / Unimportant

ould you like to be able to live at home whilst carrying out your
re-clinical training?

Definitely Yes / Probably Yes / Probably No / Definitely No

ow important to you is the particular order of medical school preference on
our UCCA application?

It represents a clear order of preference for me /

It is moderately important / It is not very important /

It is almost in 'chance' order

ow old were you when you __first__ had the idea that you would like to become a
octor? _____ years

ow old were you when you __definitely__ decided that you would like to become a
octor? _____ years

ow much did the following people or things encourage or discourage you in
pplying to study medicine?

	Strongly encouraged	Moderately encouraged	Not much influence	Moderately discouraged	Strongly discouraged
our parents					
our school teachers					
eading books					
atching television r films or listen-ng to the radio					
eading newspapers					
our own general ractitioner					
chool friends or lose colleagues					
eople already tudying at medical chool					

The following list shows a number of possible aspects of medical education in which one might be interested. Please put a "1" against that aspect in which you are most interested. Then put a "2" against the second most interesting aspect, and so on, down to "6".

Order of
Importance

Learning about the social aspects of disease.	
Learning about the psychological aspects of disease.	
Learning about the physical aspects of disease.	
Learning how to take responsibility for patients.	
Learning how to carry out complex operations on patients.	
Learning about research.	

Have you decided on the nature of an eventual career in medicine?
(Tick the appropriate category)

Yes, definitely ... ... _____
Yes, I have inclinations towards a certain
field, but have not finally decided ... _____
No, but I have firmly decided against some
kinds of work ... ... _____
No, I am quite undecided ... ... _____

Whether or not you have made up your mind, please indicate your degree of preference for a career among the following broad types of medical work:-

	Very interested	Fairly interested	Not very interested	Uninterested
Basic medical sciences or original research				
Hospital or specialist work with continuing responsibility for patients				
Clinical practice outside hospital e.g. general practice				
Hospital or specialist work without continuing clinical responsibility e.g. radiology, anaesthetics				
Hospital or specialist work of a laboratory nature e.g. pathology, bacteriology, biochemistry				
Non-clinical work e.g. public health, medical administration				

ow is a detailed list of specialties in which a medical career can be sued. Please indicate your attitude towards the specialties as a possible eer. If you either know nothing about a specialty, or have no opinions ut it at all, simply leave that answer blank.

	Definite intention to go in- to this	Very attractive	Moderately attractive	Not very attractive	Definite intention not to go into this
esthetics					
iology/Radiotherapy					
thalmology					
natology					
ology					
, Nose Throat surgery					
gery (including rosurgery, thoracic gery, etc.)					
umatic and nopaedic surgery					
icine in hospital cluding cardiology, rology, etc.)					
tetrics/Gynaecology					
diatrics					
chiatry					
eral Practice ngle-handed)					
eral Practice all partnership)					
eral Practice rge group or health tre)					
ic medical sciences					
ical Research					
oratory medicine crobiology, Chemical hology, Haematology					
rmaceutical ustry					
ical administration					
lic Health, Social icine					
senic medicine					
ustrial medicine					
ed Forces					

stimate how the following statements describe your study habits by placing tick in the appropriate box.

	Definitely Yes	Probably Yes	Probably No	Definitely No
prefer to follow up my own leas rather than to concentrate ı set work.				
cover assigned work equally ll whether it interests me or t.				
prefer not to restrict myself ly to recommended reading.				
do not consider the best way learning is by only complet-g the set work and doing the quired reading.				
find a discussion of a topic re useful than a systematic presentation.				
find it difficult to tackle mething unless I know just at is expected.				
don't let myself get diverted to something unless I know st what is expected.				
isn't often I try to think doing something differently ɔm the way described in ɔture or book.				
like to feel that everything ɔortant is contained in my tes.				

you are not accepted for medical school this year will you:-

	Definitely Yes	Probably Yes	Probably No	Definitely No
ɔly to medical school again ꜩt year?				
take your A-levels in order obtain better grades?				
ɔly to university to study ׁtistry?				
ɔly to university to read ɔther biological science? If so, what?				
ɔly to university to study a ꜩ-biological science? If so, what?				
ɔly to university to study ꜩon-science subject? If so, what?				
ɔly to study a para-ᒡical subject e.g. nursing, ꜩsiotherapy, etc.?				
ꜩer. Please specify				

you have any comments, or criticisms,of the medical school selection
ocess, please write them here. Such comments are often the most valuable
rt of a survey.

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<u>Appendix</u> 1-2.

St. Mary's study: Questionnaire 2.

University of London

St Mary's Hospital
Medical School

Norfolk Place London W2 1PG 01-723 1252

Dean: **Professor Peter Richards,**
       MA, MD, PhD, FRCP.

Secretary: **K. Lockyer, BA.**

Dear Interviewee,

As you probably know, at St. Mary's we are carrying out a research project on the selection of medical students, and you have probably already completed one questionnaire for us. Now that you have been selected for interview we would be grateful if you could take the time and trouble to complete a second set of questionnaires.

These questionnaires are fairly lengthy, but this is necessary in order to obtain an adequately broad perspective. Please do not take very long answering ea question; it is your immediate reaction rather than a deeply considered response which interests us. You may feel that you are unable to answer some of the questic as you do not have sufficient knowledge or do not understand them; if this is the case, please leave that answer blank. This study is part of a much wider study involving several other medical schools and medical students who have progressed much further through the course, and the same questionnaire is intended to apply to all of them and hence some questions may well seem too complex for you. You may also feel that some questions are silly or pointless; nevertheless we do have good grounds for believing that these questions are useful, and we would ask you to beat with us in answering them. Finally, we are aware that some of the questions are derived from American studies and hence may seem to be worded in a strange way; once more, please try and bear with us.

As with the previous questionnaire, the present one has the full approval of Dean of St. Mary's. It is however purely for the purposes of educational research and none of the replies will have any influence at all upon the process of selecting and indeed will not be analysed until the selection process is complete. Since the questionnaire is not a part of the official selection process, please try and be as truthful as possible: The questionnaire is not a necessary part of your application to the medical school, and if therefore you are opposed to completing it this is a matter for yourself. Alternatively if you feel that you would prefer not to anwer some questions please leave them blank. In the interests of research I would however be grateful if you could take the trouble to complete as much of the questionnair as possible.

My thanks in advance for your cooperation,

McManus   MA. MB. ChB, PhD.

Questionnaire B1

Name (in block capitals please) _____

Sex   Male/Female

Today's date ____ / ____ / 19 ____   4. Date of Birth ____ / ____ / 19 ____

What is the time now? _____ hrs _____ mins

Have you had your interview yet?   Yes/No

If yes, at what time did it start? _____ hrs _____ mins

If no, at what time do you expect it to start? _____ hrs _____ mins

How many other medical schools have:

i.	Already interviewed you?	0 1 2 3 4
ii.	Are definitely going to interview you?	0 1 2 3 4
iii.	Have made you an unconditional offer?	0 1 2 3 4
iv.	Have made you a conditional offer?	0 1 2 3 4
v.	Have rejected you?	0 1 2 3 4

The following questions concern your interests and activities; naturally there can be no 'right' answer to such questions.

Which of the following areas have you visited? Exclude areas you have only passed through. Answer by putting a tick in the appropriate column:-

	Never	Once only	More than once
France			
Germany			
Italy			
Switzerland			
Holland			
Belgium			
Spain			
Portugal			
Greece			
Scandinavia			
Eastern Europe			
Middle East / North Africa			
Central / Southern Africa			
India / Far East			
Russia / China			
Australasia			
North America			
South America			

Do you play any musical instruments? Not at all / Slightly / Adequately / Well (e.g. piano at grade V).

Which instrument(s)?
Have you played in a group or orchestra?   No/Yes

Estimate how many hours per week you devote to the following activities:

	0	1 - 2	3 - 4	5 - 8	9 - 15	16+
Watching television						
Playing sport						
In a pub						
On hobbies						

Do you play sport for a team?   No/Yes

Estimate how many times per year you attend the following:-

	0	1 - 2	3 - 5	6 - 10	11+
Theatre					
Opera					
Ballet					
Pop concerts					
Classical concerts					
Art galleries					
Museums					
Cinema					
Football matches					
Cricket matches					
Parties					

Estimate how many non-medical, non-school books you read per year:-

	0	1 - 5	6 - 10	11 - 20	21 - 50	50+
Fiction						
Non-Fiction						

How many works have you read by the following authors? Please put a tick in the appropriate box.

	None	One	More than one		None	One	More than one
Isaac Asimov				Stendhal			
Jane Austen				Tolstoy			
Albert Camus				Leon Uris			
Dostoievsky				Virginia Woolf			
Margaret Drabble				Edward de Bono			
George Eliot				Erich von Daniken			
Frederick Forsythe				Charles Darwin			
Günther Grass				Eysenck			
Graham Greene				Freud			
Hermann Hesse				Galbraith			
Aldous Huxley				Illich			
James Joyce				R.D. Laing			
D.H. Lawrence				C.S. Lewis			
Doris Leasing				Marx			
Christopher Marlowe				John Stuart Mill			
Maupassant				Desmond Morris			
George Orwell				Karl Popper			
Harold Robbins				E.F. Schumacher			
John Steinbeck				Lyall Watson			
Solzhenitsyn				Gombrich			

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5. Do you smoke? No/Yes; please estimate your consumption:-

       Cigarettes _____ (Number per day)
       Pipe   _____ (ounces per week)
       Cigars   _____ (Number per day)

6. How would you describe your religious beliefs?
       Christian / Jewish / Agnostic / Atheist / Other (please specify)

7. How often do you attend church?
       Never / On festive occasions only / Between three and ten times
       per year / About once a month / every week

8. Which hand do you write with? Always Right / Usually Right / Either /
                                    Usually Left / Always Left

9. How often do you read the following newspapers or journals?

	Usually	Moderately often	Rarely	Never
Daily Express				
Daily Mail				
Daily Mirror				
Daily Telegraph				
Guardian				
Morning Star				
The Star				
Sun				
The Times				
Local Newspaper				
New Society				
The Listener				
New Scientist				

For the following questions, on ethical, moral and political issues, please
remember that there are no right or wrong answers: it is your opinions
which are required. If you do not wish to answer a question, or do not
understand it, please leave it blank.

	Defin- itely Yes	Prob- ably Yes	Prob- ably No	Defin- itely No
Is a strong professional identity necessary for the practice of good medicine?				
Was the introduction of the NHS a retrograde step?				
Are psychiatric hospitals in need of greater funds and resources, if necessary at the expense of other parts of the Health Service?				
The Inverse Care Law says that in this country the areas with the greatest medical need have the least medical resources: can this be true?				
Is psychosurgery justified on convicted criminals?				

	Defin-itely Yes	Prob-ably Yes	Prob-ably No	Defin-itely No	
GP s prescribe psychoactive agents too commonly as a panacea r all ills?					**37**
)uld the following be provided or allowed under the NHS? i. Trans-sexual surgery ii. Cosmetic surgery .i. Contraception .v. Providing heroin for addicts					
commercial competition necessary for progress in drug research?					
iuld GP s be able to prescribe brand-name drugs when cheaper iivalents exist?					
iuld barbiturate prescription be controlled by stricter legal icedures?					
iuld more health education be used to discourage cigarette king?					
iuld legislation be used to restrict cigarette consumption?					
which of the following situations in which an abortion has n requested would you think that it should be performed?					
i. A woman with congenital heart disease who is unlikely to survive the rigours of childbirth.					
i. A woman known to be definitely bearing a fetus with spina bifida.					
i. A woman who might have had German Measles earlier in pregnancy.					
v. A 13-year old girl who has been raped.					
v. A 25-year old woman who has been raped.					
i. An unmarried woman who is pregnant as a result of failed contraception.					
i. A woman who has failed to use any form of contraception.					
i. A 38-year old mother of six.					
patients have the right to full information about their illnesses?					
octor has a patient who refuses the first-line treatment ered to him. Is it the doctor's duty to offer an alternative m of treatment?					
uld more cancer patients be told the true nature of their dition?					
Jehovah's witnesses have the right to expect a dangerous ration without the administration of blood?					
Jehovah's witnesses have the right to expect that their ldren will be treated in accord with their own wishes?					
the powers of the General Medical Council too far reaching?					
uld amniocentesis be compulsory for all pregnant women?					
Jld all known carriers of genetic disease be sterilised?					
poverty still a major cause of disease in this country?					
it possible that civilisation will cause more disease than cures?					
uld all research on test-tube babies be prohibited?					
politics relevant to medicine?					
ld you welcome more articles about medicine in the newspapers the articles were responsibly and accurate?					**67**

| 8 | | | | | 1 3 |

Defin-itely Yes	Prob-ably Yes	Prob-ably No	Defin-itely No

hould immediate infanticide be permissible for children born ith gross multiple abnormalities?

hould euthanasia be possible if a patient has previously greed to it whilst in full possession of his faculties?

hould euthansia be possible even if a patient has previously ade no statement as to his wishes?

s it reasonable to remove kidneys for transplantation from any ccident victim, post mortem, unless specific written evidence o the contrary is found?

o you think that there is a tendency for Asian doctors in the HS to not be given promotion because of their race?

o you think it is more difficult for the GP than for the ospital consultant to keep up to date in medicine?

o you think the GP will play a vital role in the delivery f medical care in the future?

o you think the working environment of the GP is less intel- ctually stimulating than that of the hospital consultant?

o you think the GP deserves as much prestige in the medical rofession as does the hospital consultant?

o you think the GP should play a larger role in the teaching f the medical student?

o you think that the financial reward of the G.P. is atisfactory relative to other branches of medicine?

o you think that the GP tends to develop more interesting elationships with his patients than does the hospital consultant?

o you think most doctors enter general practice because they ould be unable to get a hospital consultant's post?

re GP s as well qualified as hospital consultants?

o you think only pre-clinical medicine should be taught which s directly relevant to clinical medicine?

s a detailed knowledge of anatomy essential for all doctors?

hould teaching of undergraduates at peripheral hospitals be ncouraged?

oes repetition provide a useful way of emphasising important oints in a curriculum?

s practical experience more important than academic knowledge n the education of medical students?

hould students be encouraged to question views expressed by onsultants?

o you think that consultants might often put over their own olitical views under the guize of medical opinion?

s private practice acceptable for consultants within the NHS sing NHS facilities?

s private practice acceptable if it is entirely independent f the NHS?

s it likely that criminality will be shown to be a genetic rait?

hould insanity be regarded as a mitigating factor in criminal roceedings?

hould mentally ill criminals be treated in prisons rather

	Defin- itely Yes	Prob- ably Yes	Prob- ably No	Defin itely No

Do you think that capital punishment should be brought back:
    i. for all murders?
    ii. for murder of police or prison officers?
    iii. for acts of terrorism?

Are people motivated to work only by financial reward?

Are wage differentials important for encouraging skilled labour amongst manual workers?

Should the distribution of wealth in this country be made more equal?

Is heavy taxation at high income levels discouraging personal initiative and incentive?

Should there be encouragement of profit-sharing schemes for employees?

Are entrance charges for museums and art galleries desirable?

Should one make all possible efforts to save the life of a first-time overdose?

Should one make all possible efforts to save the life of a person who has taken his tenth overdose in three months and is not psychiatrically ill?

Is ECT (Electro-convulsive therapy) a treatment whose usage should be more strictly controlled?

Should the doctor-patient relationship be completely confidential, even at the possible risk to other individuals? e.g. a patient who says that he is sure he is going to murder his wife).

Would severe statutory prison sentences be the best means of deterring potential rapists?

Is the purpose of prison to punish rather than to reform or rehabilitate?

Is all pornography morally harmful to the individual?

Should the public display of pornographic material be more strictly controlled?

Should the availability of pornographic material be more strictly controlled?

Do you consider that all forms of advertising are acceptable?

Does the individual have the right to commit suicide?

Has sociology a valid place in a university?

Is poverty in this country primarily a result of personal inadequacy?

Should children be given sex education at the following ages:-
        i. before 5 years
        ii. 6 - 9 years
        iii. 10 - 12 years
        iv. 13 - 16 years

Is knowledge an end in itself?

Is aggression part of human nature?

Should cannabis be legalised in this country?

Do you think that genetics is far more important than environment in determining intelligence?

	Defin- itely Yes	Prob- ably Yes	Prob- ably No	Defin- itely No

e compulsion preferable to education in decreasing birth
ates in the developing world?

hould the consultant be the only person responsible for making
ecisions about patient management?

hould the consultant be the main person to make decisions
bout resource allocations and priorities in his own hospital?

oncerning homosexuality:-

   i. Is it pathological rather than just a variation of
      normal sexuality?
  ii. Are homosexuals born rather than made?
 iii. Should homosexuals be encouraged to be heterosexual?
  iv. Should homosexual couples be allowed to adopt children?

ould the state provide care and accomodation for the elderly?

an sociologists provide insights into medical practice?

o doctors sometimes impose their own moral pre-conceptions
oon their patients?

e there much in good medical diagnosis that cannot be
ritten down in books?

ave scientific advances in medicine led to a dehumanised
ttitude to patients?

ould more consideration be given to social and psychological
actors in disease?

s it reasonable to object to the use of ECT simply because
ts mode of action is unknown?

e it of any consequence if racial differences in
ntelligence are demonstrated?

ould researchers be allowed to research into differences
n intelligence between races?

e co-education desirable in secondary schools?

ould greater status be given to ability and experience
ather than to educational qualifications?

e there too much violence on television?

n your opinion does television violence exacerbate teenage
rime?

at percentage of the wealth of this country do you think
s owned by the richest 10% of the population? _____

f there were a general election tomorrow, for which party
ould you vote? _____

How long did it take you to complete this questionnaire?

_____ minutes

If you have any comments you would like to make, either about this study
in particular, or medical student selection in general, please write
them on this sheet. Such comments are often the most valuable part of
any survey.

Thank you for your help by completing this questionnaire. Please place
it in the envelope provided, write your full name on the outside of the
envelope, and return it immediately to the Porter's Lodge.

Appendix 1-3.

St. Mary's study: Dean᾽s proforma.

indidate's Name _____   UCCA Number _____

Study Number | 8 | | | | | | O |

	Exceptionally Good	Very Good	Moderately Good	Indifferent	Poor
level Results					
level Grades					
terests					
ntribution to fe of school					
nievement					
ntribution to nmunity					
admaster's port					
ential					

Definite Interview	A	
Probable Interview	B_1	
Possible Interview	B_2	
Probably not interview	C_1	
Definitely not interview	C_2	
Courtesy Interview			18

☐ 17

Candidate pre-interviewed		19
Candidate known personally	
Parents known personally	
School known personally	
Attached correspondence	
Other		24

St. Mary's study: Interviewers' proforma.

Interviewer's Initials _____

Candidate's Name _____ UCCA Number   _____

                                         Study Number   _____

Health   Good / Doubtful / Bad

Academic Ability   Adequate / Doubtful / Not Adequate

Personality   Suitable / Doubtful / Unsuitable

Potential
Contribution   Good / Moderate / Small
to school

Potential   High / Medium / Low

Personal Recommendation

Take	A
Take if possible	B_1
Waiting list	B_2
Reject	C

For Chairman only

Panel's Recommendation: A B_1 B_2 C   Undecided

If Undecided: Dean's Decision   A B_1 B_2 C

Please leave blank

8						1	5	6
								18
								28
								38

		40

57

Appendix 1-5.

Birmingham study: Questionnaire and variants for follow-up survey.

The University of Birmingham

Medical School, Vincent Drive, Birmingham 815 2TJ
Telephone 021-472 1301

Dear Student,

As part of a study involving several universities I am distributing a large questionnaire to your year, which I would be grateful if you would take the trouble to complete. The questionnaire is long and detailed but this is necessary in order to obtain an adequately broad perspective.

Naturally, as in all such research, your replies will be kept strictly confidential. We would however appreciate it if you would give your name *as* this will allow a follow-up at a later date. I must emphasise again that this data is confidential and is totally independent of any university body and is solely for the purposes of research.

The questionnaire covers a wide range of topics and it is possible that you will either not want or not be able to answer a particular question: if so, simply leave that reply blank.

Please return the completed questionnaire in the enclosed envelope, to the 'L' pigeon-hole in the Medical School. If you have any comments to make please feel free to write them in the space left for this purpose on the back of sheet 9.

Thanking you in advance for your co-operation,

D. Lockwood

Diana N.J. Lockwood
Medic VI

ied / Single.

of Birth: 19 _ _

of school attended:- Comprehensive/ Direct Grant / Grammar /
Independent Public School / Private / Secendary Modern / Other (specify)

your school single-sex or mixed? _____

rel grades obtained:-   Subject   Grade

                                1.
if a subject has   2.
taken more than   3.
please give best   4.
obtained.

A-level grade 'offer' was made to you by this university? (e.g. 2 B's and
                                                             a C).

universities and subjects did you write on your UCCA form?

                          University   Subject

                                1.
                                2.
                                3.
                                4.
                                5.
of leaving school: month _____   year _____

u have any further education between leaving school and entering

sity (e.g. technical college, other university, etc..) _____

id you do between leaving school and entering university? Please estimate
on in weeks or months.   Weeks   Months

orking in this country:
orking abroad:
ravelling abroad:
n holiday in this country:
t home in this country but
ot working:
ther (please specify) :

you recommend to others that they should take a year or more off between
 and university?
efinitely Yes / Probably Yes / Probably No / Definitely No.

you like to take an intercalated degree during your medical course?
efinitely Yes / Probably Yes / Probably No / Definitely No.

you recommend to others that they should take an intercalated degree
 their medical course?
efinitely Yes / Probably Yes / Probably No / Definitely No.

you welcome the introduction of intercalated degrees in subjects other
natomy, Physiology, Biochemistry, or Pharmacology?
efinitely Yes / Probably Yes / Probably No / Definitely No.

r father a doctor?   No / Yes.   If Yes, is he a GP? No / Yes.

r mother a doctor?   No / Yes.   If Yes, is she a GP? No / Yes.

ny siblings (brothers and sisters) have you? _____

ny of your siblings are aged 17 or over?   _____

ny of your siblings are studying medicine or are doctors? _____

t age did you first seriously consider that you would like to be a
·? _____

ich did your parents persuade you against your own wishes to study

which of the following categories does your father's occupation come? The
oups are those of the Registrar-General.
1. Professional occupations, etc. e.g. University teachers, higher
executives, company directors, lawyers, etc..
2. Intermediate occupations e.g. teachers, journalists, authors, civil
servants, pilots, managers, technicians, musicians, etc..
3. Skilled occupations e.g. accounting and costing clerks, craftsmen,
foremen, shopkeepers, mine-workers, and other skilled workmen,etc.
4. Semi-skilled occupations e.g. postmen and telephone operators,
agricultural workers, etc..
5. Unskilled occupations e.g. building and dock labourers, etc..
6. Armed forces (please state rank).
7. Others.

which county is your parental home? (n.b. new counties please!)
you are not British, what is your nationality? _____

you smoke? No / Yes. If Yes, please estimate your consumption:-

Cigarettes _____ (Number per day)
Pipe _____ (ounces per week)
Cigars _____ (number per day)

would you describe your religious beliefs?
Christian / Jewish / Agnostic / Atheist / Other (please specify)

often do you attend church?
Never / On festive occasions only / Between three and ten times per year /
About once a month / Almost every week.

you intend to emigrate to a developed country?
Definitely Yes / Probably Yes / Probably No / Definitely No.
If so, would it be temporary or permanent?
Which country?

you intend to emigrate to a developing country?
Definitely Yes / Probably Yes / Probably No / Definitely No.
If so would it be temporary or permanent?
Which country?

you made up your mind about a future career?
Definitely / Probably / Possibly / Not at all.

se give your first three choices for a career (be as specific or as general
as you like, even if you are not at all sure).

1.
2.
3.

h of the following areas have you visited? Exclude areas you have only
ed through. Answer by putting a tick in the appropriate column:-

	Never	Once only	More than once
France			
Germany			
Italy			
Switzerland			
Holland			
Belgium			
Spain			
Portugal			
Greece			
Scandinavia			
Eastern Europe			
Middle East / North Africa			
Central / Southern Africa			
India / Far East			
Russia / China			
Australasia			
North America			

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Numbers in right margin (please leave blank): 2 1, 6, 8, 9, 11, 13, 15, 17, 19, 21, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44

you play any musical instruments? Not at all / Slightly / Adequately / Well (e.g piano at grade V).

Which instrument(s)?
Have you played in a group or orchestra? No / Yes.

timate how many hours per week you devote to the following activities:

	0	1 - 2	3 - 4	5 - 8	8 - 15	15+
Watching television						
Playing sport						
In a pub						
On hobbies						

you play sport for a team? No / Yes.

imate how many times per year you attend the following:-

	0	1 - 2	2 - 5	6 - 10	10+
Theatre					
Opera					
Ballet					
Pop concerts					
Classical concerts					
Art galleries					
Museums					
Cinema					
Football matches					
Cricket matches					
Parties					

mate how many non-medical, non-school books you read per year:-

	0	1 - 5	6 - 10	11 - 20	21 - 50	50+
Fiction						
Non-Fiction						

many works have you read by the following authors? Please put a tick in the
opriate box.

	None	One	More than One		None	One	More than One
c Asimov				Stendhal			
Austen				Tolstoy			
rt Camus				Leon Uris			
oievsky				Virginia Woolf			
aret Drabble				Edward de Bono			
ge Eliot				Erich von Daniken			
erick Forsythe				Charles Darwin			
her Grass				Eysenck			
am Greene				Freud			
ann Hesse				Galbraith			
us Huxley				Illich			
s Joyce				R.D. Laing			
Lawrence				C.S. Lewis			
s Lessing				Marx			
stopher Marlowe				John Stuart Mill			
assant				Desmond Morris			
ge Orwell				Karl Popper			
ld Robbins				E.F. Schumacher			
Steinbeck				Lyall Watson			
henitsyn				Gombrich			

owlng newspapers or journals?

	Usually	Moderately often	Rarely	Never
Daily Express				
Daily Mail				
Daily Mirror				
Daily Telegraph				
Guardian				
Morning Star				
Sun				
The Times				
Local Newspaper				
New Society				
The Listener				
New Scientist				

imate how the following statements describe your study habits, by placing a
k in the appropriate box.

	Definitely Yes	Probably Yes	Probably No	Definitely No	
refer to follow up my own ideas ier than to concentrate on set work.					18
)ver assigned work equally well :her it interests me or not.					19
'efer not to restrict myself only 'ecommended reading.					20
not consider the best way of ning is by only completing the set and doing the required reading.					21
nd a discussion of a topic more .1 than a systematic presentation.					22
id it difficult to tackle something 3s I know just what is expected.					23
i't let myself get diverted onto :hing unless I know just what is :ted.					24
sn't often I try to think of doing .hing differently from the way ibed in lecture or book.					25
e to feel that everything tant is contained in my notes.					26

ollowing questions, on ethical, moral and political issues, please remember
e are no right or wrong answers: it is your opinions which are required. If
t wish to answer a question, or do not understand it, please leave it blank.

	Defin- itely Yes	Prob- ably Yes	Prob- ably No	Defin- itely No	
strong professional identity necessary for the .ce of good medicine?					27
ie introduction of the NHS a retrograde step?					28
ychiatric hospitals in need of greater funds and 'ces, if necessary at the expense of other parts : Health Service?					29
iverse Care Law says that in this country the with the greatest medical need have the least .1 resources: can this be true?					30
'---------- justified or convicted criminals?					

	Defin-itely Yes	Prob-ably Yes	Prob-ably No	Def-ite: No

P s prescribe psychoactive agents too commonly as a panacea all ills?

ld the following be provided or allowed under the NHS?
, Trans-sexual surgery
, Cosmetic surgery
' Contraception
Providing heroin for addicts

mmercial competition necessary for progress in drug research?

d GP s be able to prescribe brand-name drugs when cheaper alents exist?

d barbiturate prescription be controlled by stricter legal dures?

d more health education be used to discourage cigarette ng?

l legislation be used to restrict cigarette consumption?

ich of the following situations in which an abortion has requested would you think that it should be performed?

A woman with congenital heart disease who is unlikely to survive the rigours of childbirth.
A woman known to be definitely bearing a fetus with spina bifida.
A woman who might have had German Measles earlier in pregnancy.
A 13-year old girl who has been raped.
A 25-year old woman who has been raped.
An unmarried woman who is pregnant as a result of failed contraception.
A woman who has failed to use any form of contraception
A 38-year old mother of six.

ients have the right to full information about their lnesses?

or has a patient who refuses the first-line treatment l to him. Is it the doctor's duty to offer an alternative f treatment?

more cancer patients be told the true nature of their ion?

ovah's witnesses have the right to expect a dangerous ion without the administration of blood?

ovah's witnesses have the right to expect that their en will be treated in accord with their own wishes?

e powers of the General Medical Council too far reaching?

amniocentesis be compulsory for all pregnant women?

all known carriers of genetic diseases be sterilised?

erty still a major cause of disease in this country?

possible that civilisation will cause more diseases t cures?

all research on test-tube babies be prohibited?

itics relevant to medicine?

you welcome more articles about medicine in the newspapers articles were responsible and accurate?

	Defin- itely Yes	Prob- ably Yes	Prob- ably No	Defin itely No

ıld immediate infanticide be permissible for children born
ı gross multiple abnormalities?

ıld euthanasia be possible if a patient has previously agreed
t whilst in full possession of his faculties?

ld euthansia be possible even if a patient has previously
no statement as to his wishes?

t reasonable to remove kidneys for transplantation from any
ient vidim, post mortem, unless specific written evidence
ıe contrary is found?

ɔu think that there is a tendency for Asian doctors in the
:o not be given promotion because of their race?

ıu think it is more difficult for the GP than for the
tal consultant to keep up to date in medicine?

think the GP will play a vital role in the delivery
dical care in the future?

u think the working environment of the GP is less
lectually stimulating than that of the hospital consultant?

u think the GP deserves as much prestige in the medical
ssion as does the hospital consultant?

ı think the GP should play a larger role in the teaching
ı medical student?

ı think that the financial reward of the GP is satisfactory
ve to other branches of medicine?

think that the GP tends to develop more interesting
onships with his patients than does the hospital consultant?

think most doctors enter general practice because they
be unable to get a hospital consultant's post?

s as well qualified as hospital consultants?

think only pre-clinical medicine should be taught which
ectly relevant to clinical medicine?

etailed knowledge of anatomy essential for all doctors?

teaching of undergraduates at peripheral hospitals be
ıged?

ɔpetition provide a useful way of emphasising important
in a curriculum?

ɔtical experience more important than academic knowledge
education of medical students?

students be encouraged to question views expressed by
:ants?

think that consultants might often put over their own
:al views under the guize of medical opinion?

rate practice acceptable for consultants within the NHS
IHS facilities?

rate practice acceptable if it is entirely independent
NHS?

.ikely that criminality will be shown to be a genetic

insanity be regarded as a mitigating factor in criminal
:ings?

mentally ill criminals be treated in prisons rather

ou think that capital punishment should be brought back:-
i. for all murders?
li. for murder of police or prison officers?
li. for acts of terrorism?

)eople motivated to work only by financial reward?

,age differentials important for encouraging skilled
r amongst manual workers?

d the distribution of wealth in this country be made more
?

avy taxation at high income levels discouraging personal
ative and incentive?

d there be encouragement of profit-sharing schemes for
/ees?

itrance charges for museums and art galleries desirable?

l one make all possible efforts to save the life of a
-time overdose?

l one make all possible efforts to save the life of a
i who has taken his tenth overdose in three months
i not psychiatrically ill?

' (Electro-convulsive therapy) a treatment whose usage
be more strictly controlled?

. the doctor-patient relationship be completely
ential, even at the possible risk to other idividuals?
a patient who says that he is sure he is going to
r his wife).

severe statutory prison sentences be the best means of
ing potential rapists?

purpose of prison to punish rather than to reform or
litate?

pornography morally harmful to the individual?

the public display of pornographic material be more
ly controlled?

the availability of pornographic material be more
ly controlled?

consider that all forms of advertising are acceptable?

he individual have the right to commit suicide?

:iology a valid place in a university?

erty in this country primarily a result of personal
iacy?

children be given sex education at the following ages:-
            i. before 5 years
           ii. 6 - 9 years
          iii. 10 - 12 years
           iv. 13 - 16 years.
)wledge an end in itself?

ression part of human nature?

l cannabis be legalised in this country?

i think that genetics is far more important than environment
:ermining intelligence?

)arapsychology (ESP, psychokinesis, etc.) deserve serious

	Defin- itely Yes	Prob- ably Yes	Prob- ably No	Defin- itely No

ompulsion preferable to education in decreasing birth
s in the developing world?

ld the consultant be the only person responsible for making
ions about patient management?

d the consultant be the main person to make decisions
resource allocations and priorities in his own hospital?

rning homosexuality:-

. Is it pathological rather than just a variation of
normal sexuality?
. Are homosexuals born rather than made?
. Should homosexuals be encouraged to be heterosexual?
. Should homosexual couples be allowed to adopt children?

d the state provide care and accomodation for the elderly?

ociologists provide insights into medical practice?

ctors sometimes impose their own moral pre-conceptions
their patients?

ere much in good medical diagnosis that cannot be
en down in books?

scientific advances in medicine led to a dehumanised
ide to patients?

l more consideration be given to social and psychological
rs in disease?

reasonable to object to the use of ECT simply because
ode of action is unknown?

of any consequence if racial differences in
ligence are demonstrated?

l researchers be allowed to research into differences
ellgience between races?

-education desirable in secondary schools?

l greater status be given to ability and experience
than to educational qualifications?

ne too much violence on television?

ir opinion does television violence exacerbate teenage

ercentage of the wealth of this country do you think
led by the richest 10% of the population? _____

re were a general election tomorrow, for which
would you vote? _____

have any comments you would like to make, either about this questionnaire
ticular, or about medical education in general, please write them on the
e side of this sheet.

Thank you for your help in completing this questionnaire.

hand do you use to write with?   Right/Left

The University of Birmingham

Medical School, Vincent Drive, Birmingham B15 2TJ

Telephone 021-472 1301

Dear Student,

You may remember that a while ago we asked you to complete a lengthy questionnaire. We had an excellent response to that questionnaire, and the results are being analysed at present. However we are also interested in the way in which attitudes, etc., have changed since that previous questionnaire; we are therefore asking you, whether or not you completed the previous questionnaire, if you would be willing to complete the enclosed questionnaire. We realise that the questionnaire is very long, but this is necessary in order to obtain an adequately broad perspective. We have included almost all of the questions from the previous questionnaire, so that if you completed the questionnaire before we would be grateful if you would bear with us and complete the whole questionnaire once more. May we also assure you that at present we have no plans for a further follow-up.

Naturally, as in all such research, your replies will be kept strictly confidential. It would be appreciated if you could give your name as this will allow us to compare and contrast the results with the previous results. I must emphasise again that this data is confidential and is totally independent of any university body and is solely for the purposes of research.

The questionnaire covers a wide range of topics and it is possible that you will either not want or not be able to answer a particular question: if so, simply leave that reply blank.

Please return the completed questionnaire in the enclosed envelope, in the 'L' pigeon-hole in the Medical School. If you have any comments to make please feel free to write them in the space left for this purpose on the back of sheet 9.

Thanking you in advance for your co-operation.

Diana **N.J. Lockwood**

Medic VI

Sex: Male / Female

Married / Single.

Year of Birth: 19 _ _

Type of school attended:-   Comprehensive/ Direct Grant / Grammar /
    Independent Public School / Private / Secondary Modern / Other (specify)

Was your school single-sex or mixed?   _____

A-level grades obtained:-   Subject   Grade

                                        1.
N.b. if a subject has   2.
been taken more than   3.
once please give best   4.
grade obtained.

What A-level grade 'offer' was made to you by this university? (e.g. 2 B's and
                                                                        a C).

Which universities and subjects did you write on your UCCA form?

                        University   Subject

                                1.
                                2.
                                3.
                                4.
                                5.

Date of leaving school: month _____   year _____

Did you have any further education between leaving school and entering
university (e.g. technical college, other university, etc..) _____

What did you do between leaving school and entering university? Please estimate
duration in weeks or months.   Weeks   Months

    Working in this country:
    Working abroad:
    Travelling abroad:
    On holiday in this country:
    At home in this country but
    not working:
    Other (please specify) :

Would you recommend to others that they should take a year or more off between
school and university?
    Definitely Yes / Probably Yes / Probably No / Definitely No.

Have you taken an intercalated degree during your medical course?
    No/Yes   If Yes, in which subject? _____

Would you recommend to others that they should take an intercalated degree
during their medical course?
    Definitely Yes / Probably Yes / Probably No / Definitely No.

Would you welcome the introduction of intercalated degrees in subjects other
than Anatomy, Physiology, Biochemistry, or Pharmacology?
    Definitely Yes / Probably Yes / Probably No / Definitely No.

Is your father a doctor?   No / Yes. If Yes, is he a GP? No / Yes.

Is your mother a doctor?   No / Yes. If Yes, is she a GP? No / Yes.

How many siblings (brothers and sisters) have you?   _____

How many of your siblings are aged 17 or over?   _____

How many of your siblings are studying medicine or are doctors?   _____

At what age did you first seriously consider that you would like to be a
doctor? _____

How much did your parents persuade you against your own wishes to study

<u>A p p e n d i x</u> 1 - 6 .

Cambridge study: Variants of questionnaire from Birmingham study.

UNIVERSITY OF CAMBRIDGE

CAMBRIDGE (0223) 51386 (4

THE PSYCHOLOGICAL LABORATORY,
DOWNING STREET.
-    CAMBRIDGE.
CB23EB

Dear Student,

     As part of a study involving several universities I am distributing a questionnaire to all of the medical students in the university. I would be grateful if you could take the trouble to complete this questionnaire; it is long and detailed but this is necessary in order to obtain an adequately broad perspective.

     Naturally, as in all such research, your replies will be kept strictly confidential. We would however appreciate it if you would give your name and college as this will allow a follow-up at a later date. I must emphasise again that this data is confidential and is totally independent of any university body and is solely for the purposes of research.

     The questionnaire Covers a wide range of topics and it is possible that you will either not want to or not be able to answer a particular question: if so, simply leave that reply blank.

     I am also enclosing a second shorter questionnaire which I would also be grateful if you would complete. (The handedness questionnaire is incidentally completely unrelated to the other one). Please return the completed questionnaires in the enclosed envelope via the Internal Post. If you have any comments on the questionnaire please feel free to write them in the space left for this purpose on the back of sheet 9. If you have *any* questions please contact me at the Psychological Laboratory.

     Thanking you in advance for your co-operation,

I,C. McManus MA, MB, ChB.

ex: Male   Female

ingle / Married.

ate of Birth __/__/19__

ype of school attended:-   Comprehensive/ Direct Grant / Grammar /
    Independent Public School / Private / Secondary Modern / Other (specify)

ıs your school single-sex or mixed?   _____

-level grades obtained:-   Subject   Grade

                               1.
.b. if a subject has   2.
ıen taken more than   3.
ıce please give best   4.
·ade obtained.

ıat A-level grade 'offer' was made to you by this university? (e.g. 2 B's and
                                                                      a C).

.ich universities and subjects did you write on your UCCA form?

                               University   Subject

                               1.
                               2.
                               3.
                               4.
                               5.
te of leaving school: month _____   year _____

ve you had any further education since leaving school? (e.g. technical college,
                                                university degree, etc.)

at have you done since leaving school? Please estimate approximate duration
 weeks or months.   Weeks   Months
    Working in this country:
    Working abroad:
    Travelling abroad:
    On holiday in this country:
    At home in this country but
    not working:
    Other (please specify) :

ıld you recommend to others that they should take a year or more off between
ıool and university?
    Definitely Yes / Probably Yes / Probably No / Definitely No.

ɩou feel that the third year in Cambridge is a good idea for medical
ients? Definitely Yes / Probably Yes / Probably No / Definitely No
ɜ you decided what you would like to read in your third year?
        Definitely Yes / Probably Yes / Probably No / Definitely No
so, what? _____
ve you deбided which clinical school you would like to go to?
        Definitely Yes / Probably Yes / Probably No / Befinitely No
so, which? _____
 your father a doctor?   No / Yes.   If Yes, is he a GP? No / Yes.

 your mother a doctor?   No / Yes.   If Yes, is she a GP? No / Yes.

w many siblings (brothers and sisters) have you?   _____

w many of your siblings are aged 17 or over?   _____

w many of your siblings are studying medicine or are doctors?   _____

; what age did you first seriously consider that you would like to be a
ıctor?   _____

~·-ъ ᑍᎥᑎ ᴠᴏᴜᴦ ᴨarents persuade you against your own wishes to study

<u>Part I: Origins and Selection.</u>

"Home is where one starts from. As we grow older

The world becomes stranger, the pattern more complicated

Of dead and living. Not the intense moment

Isolated, with no before and after,

But a lifetime burning in every moment ..."

<div align="right">

T.S. Eliot, East <u>Coker.</u>

</div>

2: Selection in one medical school.

"To get a good crop of doctors one needs not only good soil and good cultivation but also good seed. In the past few years much has been written on the cultivation of the medical student... Relatively little, however, has been said about the selection of the seed that is to be cultivated ... [I]n the choice of medical students progress can only come from empirical studies"

Lancet editorial (Anon, 1948).

"What's more ... some blasted sociologist will dig over the facts and find that [a potential Nobel Laureate] was rejected by St. M's and accepted by St. T's and St. B's and doesn't this show how crass, ignorant and biased we were at St. M's".

Dudley (1978)

Summary.

A detailed description is given of the St. Mary's study of the selection of medical students for admission in October 1981. It is shown that the year chosen is representative of selection at St. Mary's, and that the applicants are typical of those applying to other London medical schools, Oxbridge and provincial schools in England and Wales in that year. The final destination of applicants is described, and their passage through the selection process and its timing are described.

The selection of medical students is controversial; and like any 'closed' process, it inevitably attracts criticism, from the profession itself (Cruickshank and McManus, 1975; Hoyte, 1982; Cobden, 1982; Simpson, 1972), from prospective students (see chapter 7), from headmasters (Lockhart, 1981), and from the media (Toynbee, 1978), and in so doing it creates its own mythology, which like all mythologies contains some truth, much speculation, and many absurdities (see e.g. Heap, 1982a,b; Fry, 1982). At a General Medical Council conference on the selection of medical students, one speaker commented that, "the literature on selection was meagre and he ... therefore had to be anecdotal"; Professor H. Walton, at the same meeting, "noted that selection procedures were largely not studied by the medical schools applying them, and felt that this was an important deficit which should be remedied" (Anon, 1979b). A bibliography on student selection for medicine during the years 1970-5 (Barker, 1976), had a total of only 77 references from the world's literature, many of them of only marginal interest or relevance. In the following chapters the selection system will be opened to scrutiny, questions asked about its fairness and its success, and the debate re-opened on possible methods of improvement.

Controversy over selection has increased with the growing suspicion over the past two decades that competition for admission has become much greater; "I could never have got into medical school nowadays", murmurs the well established consultant with a wry, apologetic smile' (Begbie, 1980). Indeed, while well-established members of the profession seem to have experienced little difficulty with getting into medical school (see e.g. Abse, 1978), A-level requirements for admission have been rising steadily since 1972 (McManus, 1982), and medical students are now second only to veterinary students in their academic achievement, and in the degree of competition to obtain university places. Concern has also

arisen over the fate of particular minority groups applying to medical school. Thus Thurman (1979) pointed out that only 1 in 6 graduate applicants was accepted, as compared with 1 in 4 of other applicants, and that in part this was a result of graduates having poor A-levels taken a number of years earlier.

In this chapter a single medical school, St. Mary's, is studied to see how it copes overall with the problem of selection. In later chapters particular parts of the selection system will be considered in more detail, and the more global problem of the system of medical student selection as a whole will be considered.

Results.

During the period September to December, 1980, 10810 persons applied to UCCA (the Universities Central Council on Admissions) and included medicine as their first choice of course (UCCA, 1982; Table 2-3). In October 1981, 3997 individuals were admitted to study medicine (UCCA, 1982; Table 2-5). The rejection rate is about 60%. Each applicant can apply through UCCA to up to five medical schools and on average each medical school had 13.2 applicants for each of its places. There was substantial variation between schools (see Table 2-1), but it must not be assumed that it is harder to get into a school with a high ratio of applicants to places, and easier to get into a school with a low ratio; minimal academic requirements must be taken into account, amongst other factors: it is not for example easier to gain a place at Cambridge, with 3.5 applicants per place, than at University College, London with 26.7 applicants per place.

Figure 2-1 summarises admission statistics for St. Mary's from 1969 to 1981. Over that thirteen year period several substantial changes have occurred. The number of applicants has risen steadily, and whilst over the period 1971 to 1974 this rise matched the overall rise in applications to UCCA, since 1974 there has been a real rise in the proportion of UCCA applicants who include St. Mary's amongst their choices (Figure 2-1b), suggesting long term changes in applicants' perception of medical schools. Applicants for admission in 1982, 1983 and 1984 were 1620, 2031, and 2137 respectively, representing increases of 9.6%, 37.4% and 44.6% over the 1981 figure. Apart from the years 1969 and 1981, the number of entrants was almost constant at an average of 92 per annum (Figure 2-1a).

The proportion of women applicants and entrants (Figure 2-1d) has risen steadily since 1969, in parallel with the national overall rise in proportion of female medical students.

The number of candidates interviewed has shown several medium term trends, with a real decline in the mid-seventies (Figure 2-1a), and an increase since about 1978. The proportion of women candidates interviewed was relatively low until 1974 (with the exception of 1971 which appears to be generally anomalous); after 1974 the proportion of women interviewed reflected the proportion of applicants. Despite the disproportion over the years 1969 to 1974, the proportion of women <u>entrants</u> was much as one would predict from applicants.

Apart from an occasional overseas applicant offers were made only to candidates who had been interviewed. The proportion of conditional to unconditional offers shows large variation, with the number of

conditional offers being closely related to the total numbers of interviews given. From 1970 to 1978 the proportion of interviewed candidates who were <u>not</u> made offers was fairly steady, although there was a sudden increase in 1980, as the result of a policy of increased numbers of interviews.

ii. <u>The St. Mary's Hospital Medical School Survey.</u>

Between 1st September and 15th December 1980, 1478 people applied to UCCA and named St. Mary's as one of their five university choices. Of these, 1361 gave a United Kingdom postal address, and these were included in the main study. 1183 (86.9%) of those in the study were British nationals, and the rest were from a wide variety of countries (see Table 2-2). 19 applicants (1.4%) were applying for admission in October 1982, and the rest for October 1981. Most candidates had included five choices of university on their UCCA form, but 13 had only placed four choices on their form, and 6 had only placed one or two choices on their form. The majority of candidates (96.5%) had made all five choices for medicine, but 27 (2.0%) had made one non-medical choice, and 21 (1.5%) had made more than one non-medical choice. The subjects of these choices are shown in table 2-3.

All individuals in the study were sent questionnaire 1 (Q1) within a day or two of receipt of their UCCA form at St. Mary's. A covering letter from myself explained that the questionnaire was entirely for educational research purposes, although it had the approval of the Dean, that I was not involved in the selection of students (at that time, at least), and that the Dean would not see the data until selection was completed. It was stressed that there was no necessity for the questionnaire to be completed, although naturally we would be grateful

for as large a response as possible.

Q1 itself contained questions about social, educational and family background, reasons for wishing to study medicine, influences upon that decision, interests in aspects of medicine and particular careers within medicine, and questions about what the candidate would do if rejected for medicine. Many of these questions were based directly on those originally asked by the Royal Commission on Medical Education (1968) (the 'Todd report'). Q1 also contained the 'sylbism' (syllabus boundness) scale of the University College London Study Questionnaire (UCLSQ) (Lucas et al, 1976). Q1 covered some 9 sides of closely typed A4 paper. The final sheet of the questionnaire was left blank, and applicants were encouraged to write at length about their views on medical school selection, and many did so, often with great feeling. These comments are the subject of a later chapter.

The questionnaire was sent with a stamped return envelope addressed personally to me at the medical school, and marked strictly confidential. 1151 (84.6%) applicants completed Q1, and of these 687 (59.7%) wrote some comments on the final sheet. The majority of the questionnaires were completed within a few days of their receipt by the applicants, and almost certainly before any had received offers or rejections from any of their medical school choices. This part of the survey is therefore strictly prospective, in contrast to previous studies which have been retrospective (Johnson, 1971a,b).

Each UCCA form was read by the Dean within a few days of its arrival in the medical school (an average of about 16/day over the three-month application period). At the time of the first reading of the UCCA form, the Dean also completed a proforma on each applicant, making a number of assessments of that candidate. Later in the year, I read each UCCA form

and the statistical data (other applications, 0- and A-level results, etc.) were coded for computer entry.

On the basis of his reading of the UCCA form (on one or more occasions) the Dean selected those candidates who would be offered interviews. A few candidates, usually those who had also applied in the previous year, were made offers without interview. 338 applicants (318 British, 20 Non-British) attended for interview, and were interviewed either in the morning or the afternoon, with all candidates being offered a conducted trip around the medical school at 1 p.m..

A second questionnaire, Q2, was given to all interviewees, and was completed by 337 of them (99.7%). The questionnaire was also sent by post to those 13 candidates who were made conditional or unconditional offers without interview (and was completed by 7 of them)). Q2 consisted of nine pages of closely typed A4 sheets, and asked about previous interview experience, and about cultural, sporting and other interests, as well as about ethical, political, and social attitudes. The questionnaire also contained the Eysenck Personality Questionnaire (EPQ) (Eysenck and Eysenck, 1975), and the State-Trait Anxiety Inventory (STAI) (Spielberger et al, 1970).

As with Q1, a covering letter from myself explained to candidates the purpose of the questionnaire, and its complete independence of the selection process per se. Half of the interviewees (the first five each morning and the first five each afternoon) received the questionnaire after their interview, the rest received the questionnaire before their interview. Candidates sat in the Medical School library whilst completing the questionnaire, and thus were prevented from discussing it among themselves. As with Q1, Q2 offered candidates the opportunity for free comment, but only 153 (44.5%) availed themselves of the opportunity,

a number saying merely that they had said everything on Q1. On average candidates took 39 minutes to complete Q2 (10th percentile = 24 mins; 90th percentile= 55 mins).

Each candidate was interviewed by a panel of two interviewers and a chairman. Four chairmen were used, to maintain continuity of standards, each being a senior member of the medical school; each chairman attended from 67 to 106 interviews (mean=84.3). The two interviewers were chosen from a clinical and a pre-clinical department, and each attended only a few interviewing sessions (32 interviewers; mean number of interviews = 19.75; SD=8.20; range= 6 to 38). Each interviewer and the chairman took turns to question the candidate, the whole interview lasting fifteen minutes; candidates were always invited to ask the interviewers any questions they wished. At the end of the the whole interview, each interviewer completed a short proforma giving his estimate of the candidate, and then the panel came to a collective recommendation on the candidate. On the basis of that recommendation the Chairman and the Dean decided on what offer to make to a candidate.

The final part of the survey was completed after October 1981 when the A-level results of all applicants who were pre-A-level at the time of the application were obtained from the A-level Examining Boards, and the final destination of each applicant for that year was supplied by UCCA.

iii. The students surveyed as a representative national sample.

The 1361 applicants surveyed in this study comprised 12.6% of all applicants to British medical schools in Autumn 1980, and the 517 who went to a medical school represent 12.9% of all entrants accepted to read medicine in October 1981. The final two columns of Table 2-1 show that

for each medical school the overall ratio of applicants to acceptances is very similar to that obtained by the St. Mary's applicants in this study who also applied to that medical school.

The main selection bias in this study is that all the individuals have included St. Mary's on their UCCA form, but the fact remains that the outcome of their applications showed that they were a representative sample of all applicants in terms of their success in gaining admission at one school or another.

Although representative in terms of successful application to read medicine, it is clear from table 2-1 that those surveyed comprised about 20% of all applicants to London University medical schools, and formed a much smaller proportion of applicants to provincial schools; the proportion of applicants applying to Scottish medical schools is so small that the results should be interpreted with care. Nevertheless the study contains at least 28 applicants to every British medical school (median= 141), and at least two acceptances by every British medical school (median= 13) (see Table 2-1)). Unless the sample is grossly atypical of applicants and acceptances, it should allow, with appropriate statistical analysis, consideration of the national selection process as a whole. It is also worth noting that some 8.3% of the applicants have named only one London medical school (i.e. St. Mary's), and a further 14.8% have named only two London schools; 37.2% of applicants selected all London schools for their UCCA application.

iv. The outcome **of** applications.

Of 1478 applicants to St. Mary's, 94 (6.4%) eventually arrived there in October 1981. A further 436 (29.5%) went to other medical schools. One applicant who was accepted for veterinary medicine, and one applicant accepted at Cambridge for natural sciences (in both cases their first choice) were counted as 'acceptances'. Three candidates holding conditional offers re-applied to UCCA in October 1981, as a result of their high A-level grades, and one went to Cambridge and two arrived at St. Mary's in October 1982. 176 (11.9%) applicants went to university to read a subject other than medicine, and table 2-4 summarises the courses for which these applicants were accepted. 8.7% were accepted for subjects directly allied to medicine, 57.2% for biological sciences, 14.5% for physical sciences, 4.6% for maths or computing, 6.9% for engineering, 4.6% for social sciences, and 3.5% for 'Others' (English or Law). 772 applicants (52.2%) did not go to university in October 1981.

Figure 2-2 summarises how these applicants proceeded to their eventual destinations.

After their UCCA form had been read by the Dean, the candidates were interviewed (24.8%), made an offer without an interview (1.3%), rejected (72.8%), or withdrew (1.0%), the latter usually due to their having been offered a place elsewhere, or else having completed their UCCA form incorrectly (e.g. incompatible university names and code-numbers). Of those who were rejected without an interview, 5 (5.1%) were subsequently interviewed during August/September 1981 as a part of the Clearing scheme. After interview (or in a few cases without) candidates were either made conditional offers (180), unconditional offers (36), or were put on the 'waiting list' (36), the latter being used for students who could not be made a a firm offer but would be re-considered in August

1981 if they had not yet gained a place elsewhere. 104 candidates were rejected outright at the time of interview.

After candidates had been made unconditional offers they were required to make a provisional acceptance, and then a definite acceptance (Figure 2-3). Of 36 unconditional offers made, only 12 (33.3%) eventually arrived at St. Mary's, most of the remainder going to other medical schools; 10 (27.8%) went to Oxford or Cambridge. All students made unconditional offers by St. Mary's eventually entered a medical school.

Candidates who were made conditional offers (usually upon subsequent A-level grades, but in a few individuals who lacked subjects required at 0-level if not offered at A-level, upon 0-level grades, and in one case upon both), were required under the UCCA rules to accept the offer first provisionally and then definitely or else to reject the offer (see figure 2-4). The standard offer for applicants sitting advanced level for the first time was B (Chemistry) and two C grades; 129 applicants received this offer. A further 11 applicants were set higher targets depending on whether they were re-sitting immediately in the autumn or delaying until the next summer; still higher grades were asked if only one or two subjects were to be re-taken. A target of CCC was set to 32 applicants, in most cases in an attempt to attract excellent candidates who could easily out-perform their target, but in a few cases in recognition of disturbed schooling. Three applicants lacked the necessary 0-level passes in Biology or Physics and an 0-level pass was included in their requirement. Two candidates were offered a place conditional on a II.1 honours degree. Table 2-5 summarises the offers made to candidates. Of 180 candidates made conditional offers only 95 (52.8%) were still holding them by July 1981, the majority of the rest having withdrawn in favour of

other medical schools. Of these 95, only 66 (69.5%) obtained adequate A-level grades to satisfy the condition of the offer. Of those not gaining acceptable grades, 2(6.9%) went to other medical schools, 8 (27.6%) took up non-medical courses and the rest were rejected outright. Thus of 180 conditional offers made, only 66 (36.7%) eventually arrived at St. Mary's.

Overall those in the survey were made 216 offers (which are in principle a contractual obligation), and of these only 78 (36.1%) eventually arrived at St. Mary's with, in many cases, the destination not being known about until quite late in the selection process. Figures 2-2, 2-3 and 2-4 also contain information on the average 0 and A-level grades for applicants in the various groups, calculated on the basis of 5 points for an A grade, 4 for a B, etc..

v. Timing of applications.

The timing of applications is of importance both to candidates, since it appeared to affect the chance of success, and also to medical schools, since it determines the rate at which they can make offers to candidates. Figure 2-5a shows the eventual destination of candidates as a function of the date at which their application was received at UCCA. Differences between deciles are highly significant (Chi-squared= 245.1, 45 df, p<<0.001), with earlier applicants faring far better than later applicants, this also being reflected in the lower interview rate for later applicants (Figure 2-5b: Chi-squared= 177.4, 9 df, p<<0.001). The interpretation of Figure 2-5a is, however, complicated by the fact that later applicants are less well qualified academically than are earlier applicants (Figure 2-5b), having lower 0-level grades (F(9,1222)= 13.7, p<<0.001) and lower A-level grades (F(9,1315)= 17.9,p<<0.001).

Furthermore there is a suggestion that later candidates are less well motivated, a lower proportion of them returning the postal questionnaire (Q1) (Chi-squared= 35.1, 9 df, p <0.001).

Figure 2-6 shows cumulative distributions of the times at which events happen to applicants. It can be seen that there is a large spread in the arrival of forms at UCCA, and that much of the subsequent variation is conditioned by the time of application, with there being a tendency for greater variability with later events. Table 2-6 summarises the intervals between various events in the selection process. In general delays were small, the major exceptions occurring around the Christmas period. Candidates often waited a while for rejections if they were not interviewed, reflecting the fact that their applications were often re-assessed in the light of other applications which had subsequently been received.

vi. Position on the UCCA form.

Candidates place their five university choices in order of preference, and are able to use any 'bracketing' that they desire. St. Mary's was placed 1st or 1st equal by 293 (21.5%) candidates, 2nd or 2nd equal by 360 (26.5%), 3rd or 3rd equal by 297 (21.8%), 4th or 4th equal by 236 (17.3%) and 5th by 175 (12.9%). Candidates spend much time agonising over the exact ordering of their choices. St. Mary's claims in its prospectus that it takes relatively little notice of the position it has been placed on the UCCA form (in clear distinction to certain other schools, who demand that they are placed at or very near the top of the form) and indeed it has such a reputation amongst applicants. However those who eventually arrive at St. Mary's have put it higher on their UCCA form (mean position = 2.1) than the average applicant (mean

position= 2.7). Figures 2-2, 2-3, and 2-4 show the mean position of St. Mary's for the applicants in particular categories. Those interviewed tended to have placed St. Mary's slightly higher than those who were not interviewed (2.4 vs 2.9, t = 5.8, p<0.001). Those made offers without interview had placed St. Mary's particularly high, but often had only put St. Mary's or St. Mary's and Oxbridge on their UCCA form, having delayed entry after fulfilling the requirements of a conditional offer the previous year. Amongst those made conditional offers, those who withdrew had placed St. Mary's lower (mean=3.0) than those who accepted the offer (mean=2.0) (t=5.6, p<0.001). Similarly, those who accepted an unconditional offer had placed St. Mary's higher (mean2.1) than those who withdrew from such an offer (mean=2.8) (t=2.3, p<0.025). Thus the discrepancy between applicants and acceptances is partly due to the medical school itself tending to interview those who placed it higher, (although there was no tendency for position on the UCCA form to influence the likelihood of an offer after interview), and partly a result of applicants who placed St. Mary's higher tending to accept the offer that it made.

Conclusions.

In this chapter I have given a broad descriptive survey of the process of medical student selection in one London medical school, and the grounds on which the population surveyed is considered to be representative of candidates to other medical schools in the University of London, to other universities in England and Wales, and in Scotland and Northern Ireland. As such no hypotheses have been tested but rather the 'natural history' of the process has been described, thereby completing an obvious gap in the current literature. In further chapters

I shall analyse in some detail those factors which determine the individual elements of the process, and will attempt to determine whether or not the system is a 'fair' one.

Figure 2-1. Summarises secular trends in selection at St. Mary's Hospital medical school from 1969 to 1981. Figure 2-1a (top left) shows the number of interviews, conditional offers, unconditional offers, and entrants for each year. Figure 2-1b (bottom left) shows the total number of applications to St. Mary's (●), the total number of applicants to UCCA overall (•), and the number of St.Mary's applicants as a percentage of UCCA applicants (❑). Figure 2-1c (top right) shows the percentage of interviewed candidates who were not made offers (•).

Figure 2-1d (bottom right) shows the percentage of applicants (■), interviewees (Δ) and entrants (•) to St. Mary's, and of medical applicants to UCCA (•) who were female.

Interviews

Cond. offers

Entrants

Uncond. offers

Interviewees not made offers

%

Applicants + 100

UCCA ÷ 1000

% UCCA app's

Entrants

Females:

UCCA

Applicants

Interviewees

%

70   72   74   78   78   80

70   72   74   78
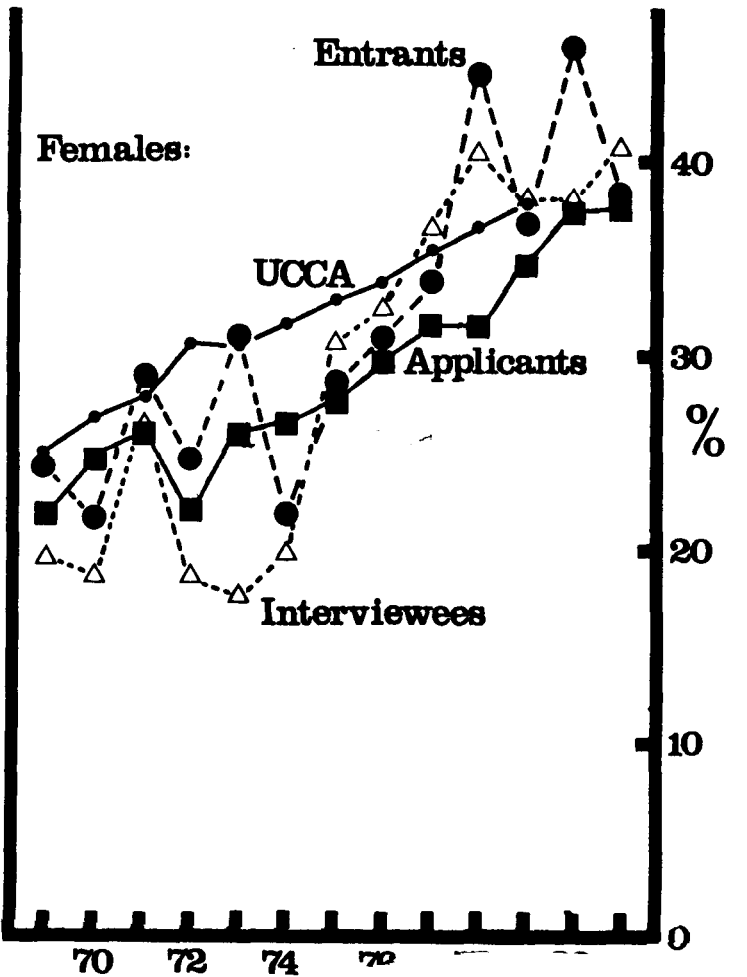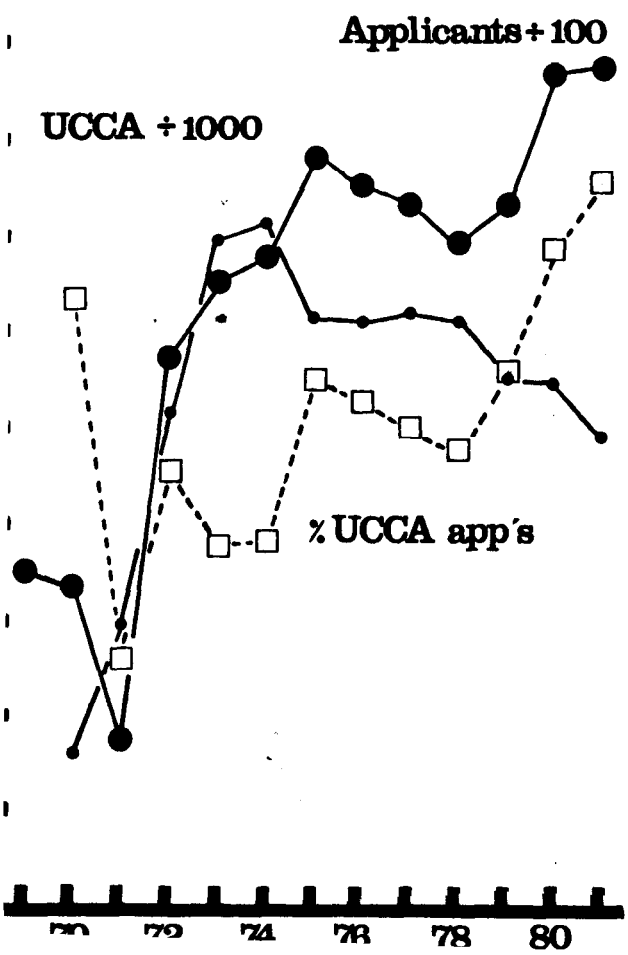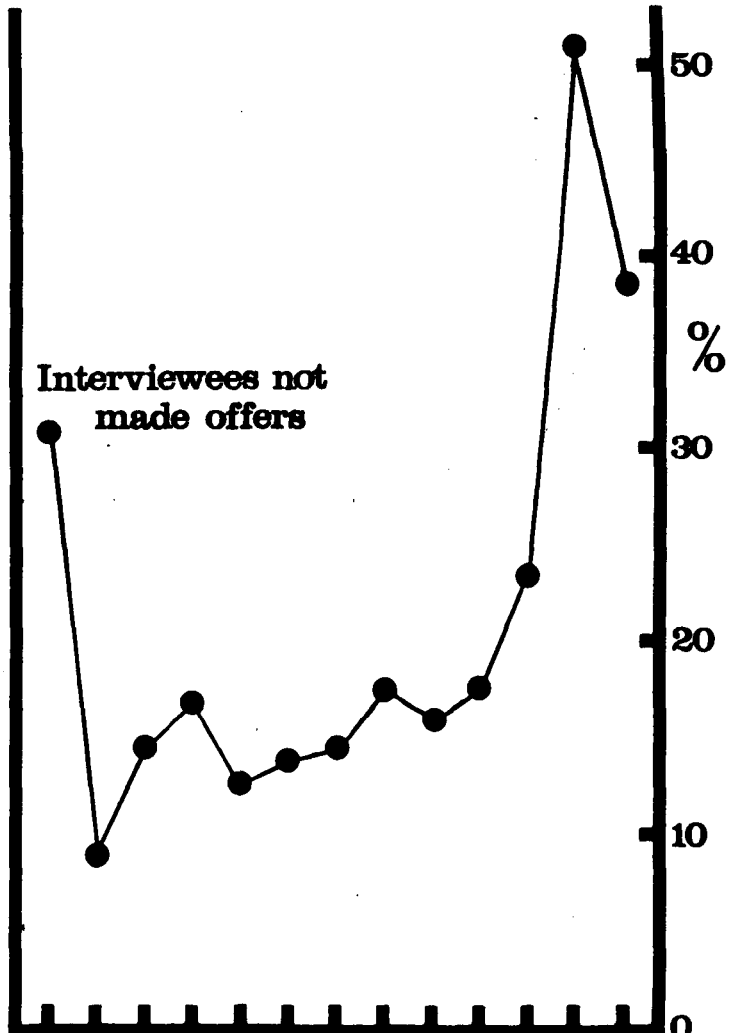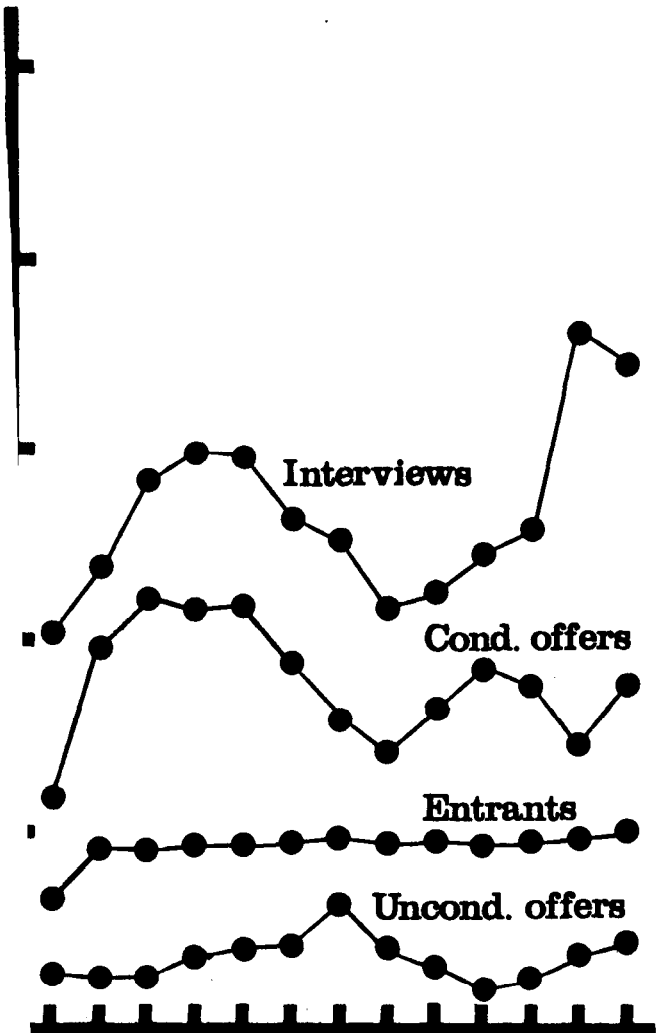
Figure 2-2. Summarises the progress of applicants through the selection process, and their eventual destinations. Figures in the boxes show the total number of individuals (N), the number of UK nationals (UK), the number of individuals who returned questionnaire 1 (Q1), the mean position of St.Mary's on the UCCA form (POS), the mean 0-level grade (0-LV) and and the mean A-level grade (A-LV) of those in the particular box (see Key for the location of the various items). Figures in circles represent the numbers of individuals in particular combinations of intermediate and final destinations. Numbers alongside arrows are the numbers of individuals involved. Abbreviations: U/C OFFER: unconditional offer; COND. OFF.: conditional offer; WAIT LIST: waiting list; NON UK ADD: non- UK postal address; LOND. MED: other London medical schools; NON-L. MED; non-London, non-Oxbridge medical school; NON-MED: non-medical university course; NOT ACC: not accepted for a university course.

SMHMS:MSSS Summary

ALL APP'S
1478

IN STUDY
1361 1183 1151
2.73 3.98 2.97

1361   338   18   14   5   986   117

INTERVIEW
338 318 314
2.39 4.29 3.71

OFFER
18 17 14
1.94 4.20 3.84

8   5   5   28   175   31   104

U/C OFFER	COND. OFF.	WAIT. LIST	REJECTED	WITHDRAWN	CLEARING	REJECTED	NON UK
36 36 28	180 173 170	36 30 34	104 96 96	14 13 7	5 3 5	986 832 811	117
2.54 4.40 4.24	2.44 4.41 4.41	2.17 4.03 3.35	2.23 4.10 3.37	3.36 4.31 3.89	1.20 4.23 3.80	2.87 3.85 2.67	
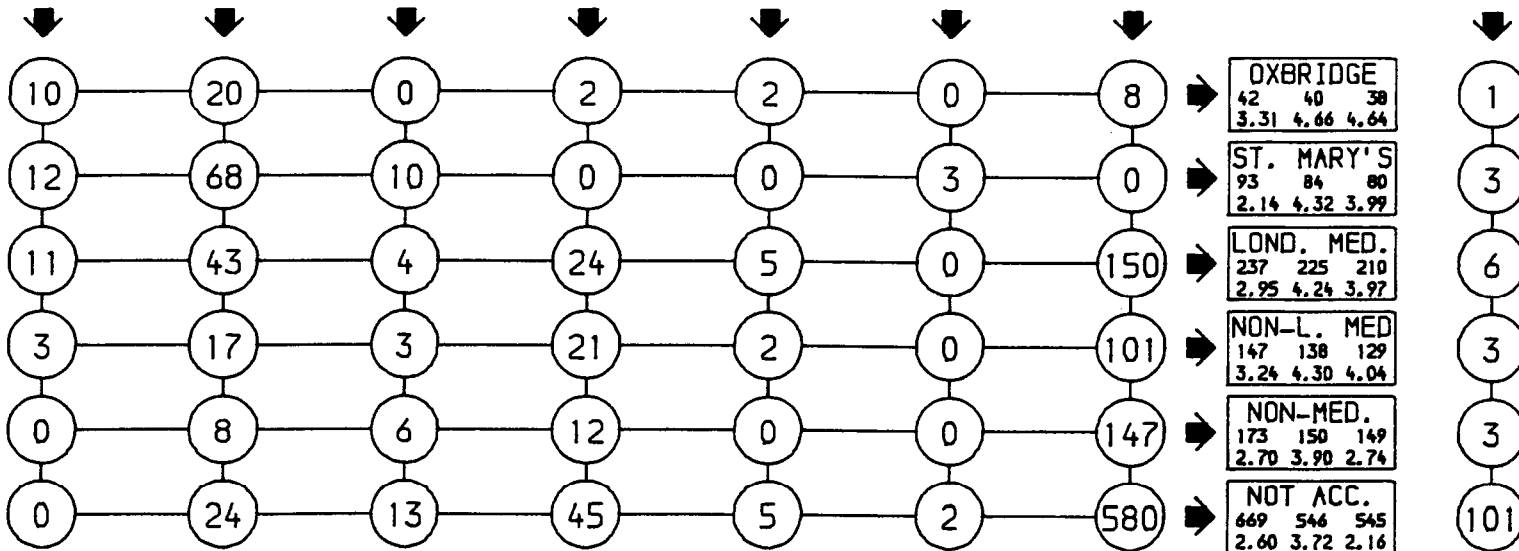
U/C OFFER	COND. OFF.	WAIT. LIST	REJECTED	WITHDRAWN	CLEARING	REJECTED		NON UK
10	20	0	2	2	0	8	OXBRIDGE 42 40 38 / 3.31 4.66 4.64	1
12	68	10	0	0	3	0	ST. MARY'S 93 84 80 / 2.14 4.32 3.99	3
11	43	4	24	5	0	150	LOND. MED. 237 225 210 / 2.95 4.24 3.97	6
3	17	3	21	2	0	101	NON-L. MED 147 138 129 / 3.24 4.30 4.04	3
0	8	6	12	0	0	147	NON-MED. 173 150 149 / 2.70 3.90 2.74	3
0	24	13	45	5	2	580	NOT ACC. 669 546 545 / 2.60 3.72 2.16	101

Figure 2-3. Shows the fate of candidates made unconditional offers at St. Mary's. For items in boxes see Figure 2-2. Abbreviations; PROV ACC: provisional accceptance; DEF ACC: definite acceptance. Otherwise see Figure 2-2.

U/C offers

Summary

OFFER MADE		
36	36	28
2.54	4.40	4.24

29 →

PROV ACC.		
29	29	22
	4.42	4.30

7

17

12

WITHDRAWN		
7	7	6
3.13	4.32	4.04

WITHDRAWN		
17	17	13
2.59	4.49	4.47

DEF ACC.		
12	12	9
2.08	4.32	4.06

			OXBRIDGE		
2	8	0	10	10	8
			2.40	4.51	4.65

			ST. MARY'S		
0	0	12	12	12	9
			2.08	4.32	4.06

			LOND. MED.		
5	6	0	11	11	8
			3.09	4.36	4.22

			NON-L. MED		
0	3	0	3	3	3
			2.67	4.54	4.19

			NON-MED.		
0	0	0	0	0	0

			NOT ACC.		
0	0	0	0	0	0

Figure 2-4. Shows the fate of candidates made conditional offers at St. Mary's. For items in boxes see Figure 2-2. Abbreviations: A-LEVELS? : candidates awaiting A-level results; UCCA 82: candidates reapplying to UCCA for admission in October 1982. Otherwise see Figures 2-2 and 2-3.

SMHMS:MSSS
Cond. offers
Summary

KEY
N   UK   Q1
Pos O-lv A-lv

OFFER MADE 169→ PROV. ACC. 98→ DEF. ACC. 98→ ALEVELS ?
180 173 170   169 162 159   98 93 89   98 93 86
2.44 4.41 3.88   4.41 3.87   4.29 3.52   4.29 3.52

11↓   71↓   3   37   66

WITHDRAWN   WITHDRAWN   UCCA 82   INADEQUATE   ADEQUATE
11 11 11   71 69 70   3   3   3   29 28 28   66 64 58
2.27 4.44 3.99   3.07 4.59 4.35   2.00 4.64 4.89 1.76 4.06 2.34 2.12 4.37 3.97

0   19   1   0   0   → OXBRIDGE
                                            20 19   0
                                            3.40 4.73 4.69

0   0   2   0   66   → ST. MARY'S
                                            68 64   0
                                            2.12 4.37 3.97

7   35   0   1   0   → LOND. MED.
                                            43 42   0
                                            2.56 4.47 4.18

2   14   0   1   0   → NON-L. MED
                                            17 17   0
                                            3.41 4.58 4.00

0   0   0   8   0   → NON-MED.
                                            8   8   0
                                            1.75 4.12 ••••

         3   0   10   NOT ACC.

Figure 2-5. Shows (a: top) the fate of candidates and (b: bottom) the average O- and A-level grades, and the likelihood of a candidate being interviewed or of returning questionnaire 1, as a function of the decile of time of receipt of the application at UCCA. The median date of each decile is shown between the two parts.
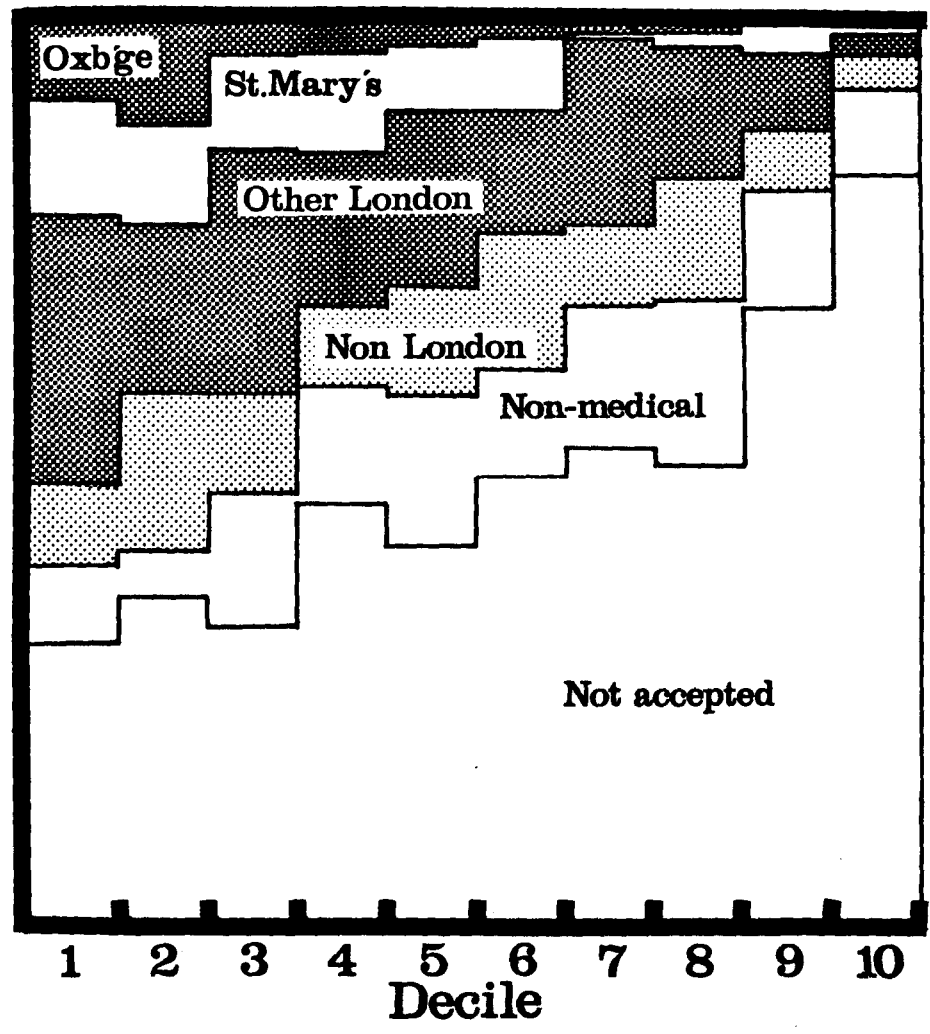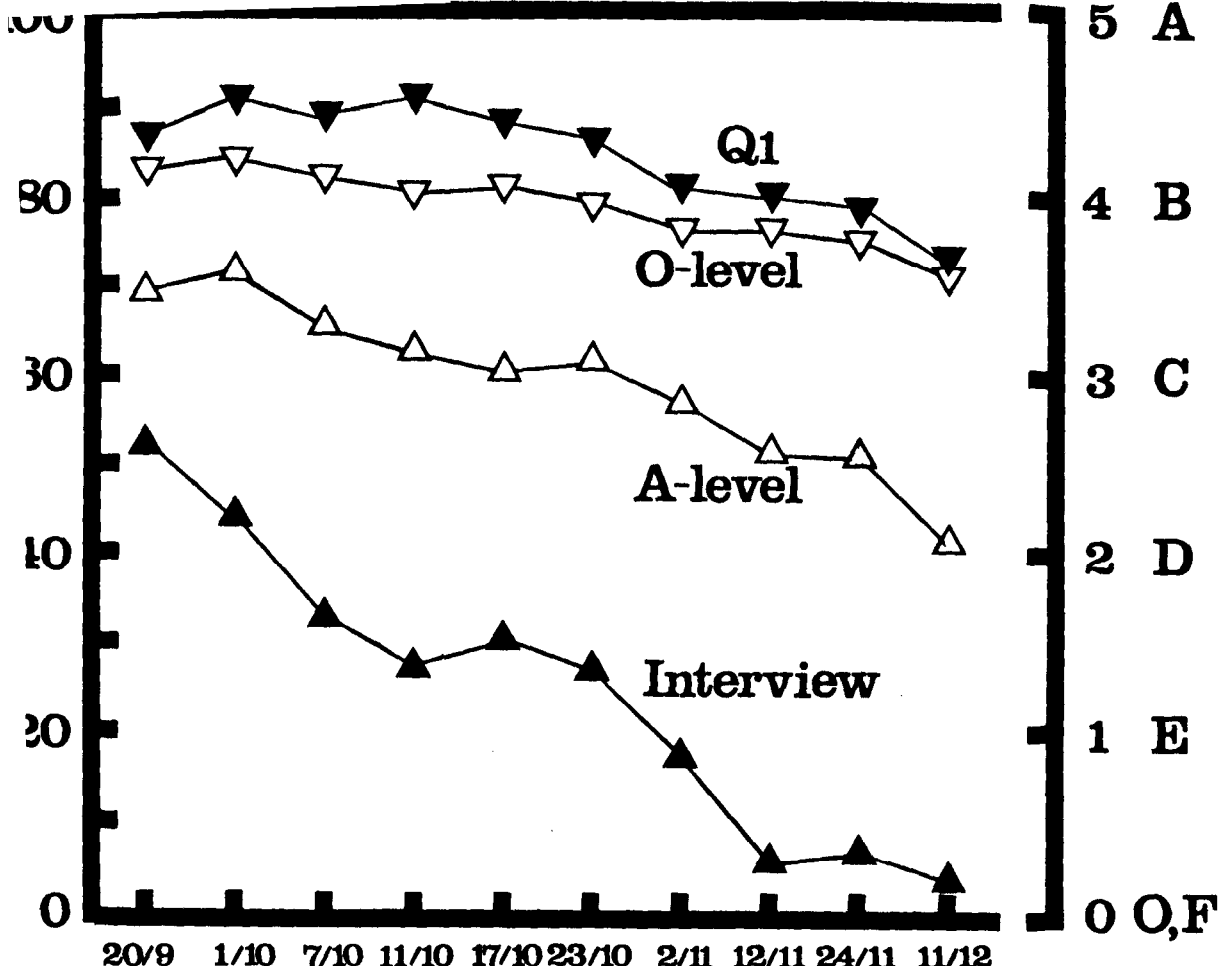
Figure 2-6. Shows the cumulative numbers of individuals in particular event categories by date. Notes: UCCA: date of receipt of application at UCCA; St. Mary's: date of receipt of application at St. Mary's; Dean: date application first read by the Dean; Interview: date interview held. Dates of rejection and withdrawal are on receipt or notification at St. Mary's.

October 1981, and the numbers of those applicants and acceptances **who** were included in the
St **Mary'e Medical Student Selection Survey.**

	male	female	total	male	female	total	N	%	N	%	Overall	In survey	
Oxbridge													
Cambridge	429	303	732	130	82	212	79	10.7	27	12.7	3.5	2.9	Cambridge
Oxford	na	na	462	56	45	101	52	11.2	15	14.8	4.6	3.5	Oxford
London Medical Schools													
Charing Cross	1854	1123	2977	65	55	120	551	18.5	29	24.1	24.8	19.0	Charing Cross
Guy's	727	360	1087	61	44	105	187	17.2	21	20.0	10.4	8.9	Guy's
King's	998	691	1689	48	35	83	281	16.6	13	15.6	20.3	21.6	King's
The London	na	na	1571	64	41	105	286	18.2	21	20.0	15.0	13.6	The London
The Middlesex	956	624	1580	52	38	91	358	22.6	14	15.3	17.4	25.6	The Middlesex
Royal Free	1240	1133	2373	55	53	108	457	19.2	16	14.8	21.9	28.6	Royal Free
St. Barts	1067	630	1717	76	54	130	335	19.5	35	26.9	13.2	9.6	St. Barts
St. George's	794	562	1356	65	39	104	256	18.8	20	19.2	13.0	12.8	St. George's
St. Mary's	922	549	1471	62	38	100	1361	92.5	91	91.0	14.7	15.0	St. Mary's
St. Thomas's	674	379	1053	55	34	89	238	22.6	25	28.0	11.8	9.5	St. Thomas's
University Coll	1562	1159	2721	49	53	102	439	16.1	25	24.5	26.7	17.6	University Coll
Westminster	773	502	1275	58	28	86	219	17.1	18	20.9	14.8	12.2	Westminster
England and Wales													
Birmingham	1107	721	1828	109	49	158	140	7.6	20	12.6	11.6	7.0	Birmingham
Bristol	na	na	1135	55	78	133	92	8.1	12	9.0	8.5	7.7	Bristol
Cardiff	na	na	1465	93	57	150	149	10.1	15	10.0	9.8	9.9	Cardiff
Leeds	1210	774	1984	98	62	160	105	5.2	7	4.3	12.4	15.0	Leeds
Leicester	na	na	2244	50	50	100	166	7.4	12	12.0	22.4	13.8	Leicester
Liverpool	958	652	1610	93	57	150	80	4.9	10	6.6	10.7	8.0	Liverpool
Manchester	1350	965	2315	114	86	200	141	6.0	12	6.0	11.6	11.8	Manchester
Newcastle	1238	885	2123	72	59	131	123	5.7	5	3.8	16.2	24.6	Newcastle
Nottingham	1138	842	2030	75	55	130	126	6.2	9	6.9	15.6	14.0	Nottingham
Sheffield	1210	897	2107	68	83	151	112	5.3	9	5.9	14.0	12.4	Sheffield
Southampton	1086	682	1768	71	46	117	155	8.7	8	6.8	15.1	19.4	Southampton
Scotland and Northern Ireland													
Belfast	455	211	666	96	55	151	33	4.9	5	3.3	4.4	16.5	Belfast
Aberdeen	na	na	1258	67	65	132	32	2.5	3	2.2	9.5	10.7	Aberdeen
Dundee	678	503	1181	64	48	112	37	3.1	7	6.3	10.5	5.3	Dundee
Edinburgh	889	628	1517	99	84	183	29	1.9	4	2.1	8.3	7.3	Edinburgh
Glasgow	805	463	1268	121	97	218	28	1.9	2	0.9	5.8	14.0	Glasgow
St. Andrews	476	289	765	48	35	83	35	4.4	7	8.4	9.2	5.0	St. Andrews
Total			49328			3995	6682	13.5	517	12.9	12.3	12.9	Total

Table 2-2: Shows the nationality of non-British applicants.

Bangladesh	2	Cameroon Republic	2
Canada	2	Colombia	2
Cyprus	3	Eire	8
Ethiopia	1	Germany, West	2
Ghana	3	Greece	1
Grenada	1	Hong Kong	2
India	25	Indonesia	1
Iran	8	Iraq	1
Jordan	2	Kenya	2
Kuwait	1	Lebanon	3
Libya	1	Malaysia	38
Malta	1	Mauritius	1
Netherlands	1	New Zealand	1
Nigeria	11	Norway	1
Pakistan	7	Phillipines	1
Poland	3	St. Vincent	1
Sarawak	1	Sierra Leone	2
Singapore	2	South Africa	1
Spain	1	Sri Lanka	12
Sudan	1	Syria	1
Taiwan	1	Thailand	2
Trinidad	1	U. S. A.	7
Zambia	2	Zimbabwe	2
Stateless	3		

Table 2-3: Non-medical courses specified on their UCCA form by St. Mary's applicants.

'Medical' subjects.	26	
Veterinary science		16
Dentistry		6
Medical biology		4
Biological Sciences.	31	
Biochemistry		3
Pharmacy/pharmacology		13
Physiology/Immunology		4
Biology/Microbiology/Zoology		9
Genetics		1
Agricultural science		1
Physical sciences	7	
Natural Sciences		5
Physics		2
Mathematics and computing	5	
Maths		5
Engineering	6	
Engineering/Electrical		
Engineering/Electronics/		
Civil Engineering		6
Social sciences	2	
Psychology		2
Others	1	
Law		1

Table 2-4: shows courses studied by those
candidates who were not accepted for medicine.

Course	Total	Count
'Medical' subjects.	15	
Medical biochemistry		5
Medical cell biology		1
Medical physics		2
Medical biology		2
Medicinal chemistry		1
Nursing		2
Dentistry		2
Biological Sciences.	99	
Physiology		8
Physiology with Anatomy/pharmacy/biochemistry		6
Pharmacology/pharmacy		13
Pharmacology with biochemistry		1
Biochemistry		29
Biochemistry with chemistry		1
Biology		18
Biology with geology		1
Applied biology		1
Human biology		2
Zoology		4
Zoology with Marine zoology		1
Plant science		3
Genetics		3
Genetics with cell biology		2
Genetics with biophysics		2
Microbiology		2
Agricultural sciences		4
Physical sciences	25	
Chemistry		14
Chemistry with education		1
Chemistry with administration		1
Colour chemistry		1
Industrial chemistry		1
Physics		4
Physics with maths		1
Natural sciences		2
Mathematics and computing	8	
Maths		4
Computing		4
Engineering	12	
Engineering		2
Mechanical engineering		1
Civil engineering		1
Chemical engineering		4
Electrical engineering		2
Electronics		1
Ergonomics		1
Social sciences	8	
Psychology		2
Psychology with philosophy		1
Anthropology		1
Archaeology		1
Economics		3
Others	6	
Law		5
English		1

Table 2-5: Shows offers made **to candidates with conditional** offers.

A-level grades	0-level grades	N
A	-	2
C	-	2
BB	-	3
BC	-	1
BBB	-	2
BBC	-	1
BCC	-	129
BCC	C	1
CCC	-	31
CCD	-	1
-	A	1
-	B	3

Table 2-6. Shows the interval in dayo between various events
during processing of an application (to nearest half day).

From	To	Median
Arrival at UCCA	Processing in St. Mary's Office	15.0
Processing in St. Mary's Office	Dean's initial assessment	3.5
Dean's initial assessment	Interview	13.5
Interview	Notification of unconditional offer	3.5
Interview	Notification of conditional offer	4.5
Processing in St. Mary's Office	Date of rejection if candidate not interviewed.	41.5
Interviewview	Withdrawal from unconditional offer	71.0
Notification of u/c offer	Withdrawal fran unconditional offer	66.5
Interview	Withdrawal fran conditional offer	93.5
Notification of cond. offer	withdrawal fran conditional offer	85.5

3: Bias in selection.

"Of those hundred and fifty students few were country lads like myself. The greater part came from the surrounding industrial region. They were nearly all middle-class folk, and a large number - between thirty and forty - sons of medical men ..."

Francis Brett Young,

Dr. Bradley Remembers, (1938; p.115).

"The Robbins committee ... heard evidence that a system of university admissions based chiefly on GCE grades was undesirable. This criticism came from both the schools and the universities..."

Choppin (1979; p.213).

Summary.

The effects of demographic, educational, family, and application factors upon success in admission to medical school are analysed in the St. Mary's Study. The inter-relatedprocesses of differential application, systematic selection, differential selection, and differential acceptance are analysed separately, for each of the variables of interest, in relation to admission to five groups of medical schools. A multiple logistic regression of the overall likelihood of selection showed that the most important overall determinant of success was A-level achievement. In addition 0-level achievement, early application, and medical parents were independent predictors of success, although the effects of the latter variables were relatively small. Social class did not predict acceptance. Causal analyses of the determinants of educational achievement and early application are also presented.

Of the 10,810 people who applied through UCCA for admission to medical school in October 1981 only 3997 were admitted. 65.3% were rejected. Such a high rate of rejection raises public concern as to whether the selection process is fair. It is a common belief, for example, that medical schools tend to select preferentially those who are male, who have been educated at public school, or who are the children of doctors. In this chapter data from the St. Mary's Study is analysed in order to determine whether or not the selection process is 'fair', and by means of an appropriate statistical analysis of this sample of national applications conclusions will be drawn not only for St. Marys alone, but for the system of selection as a whole.

The variables examined have been demographic (nationality, sex, age, social class and region of domicile), educational qualifications (0- and A-level results, pre- or post-A-level application, subjects taken), type of schooling (public or private sector, size of school, size of sixth form, number in sixth form going to university), family background (medical parents), and the manner in which the UCCA form has been completed (the number of choices for medicine, the number of London medical schools chosen, the use of bracketing in stating preferences, whether or not a previous application has been made to UCCA, and the date of receipt of the application at UCCA). The question of whether the selection process is biased towards candidates with particular personality, attitudes, cultural and other interests, or interests in particular aspects of medicine or particular medical careers is deferred until chapter 6.

Method

The survey has been described in detail in chapter 2. 1361 applicants to St. Mary's were asked to complete a series of questionnaires, and were followed up to find their eventual destination. Of the 1183 UK nationals, 487 (41.2%) were admitted to medical school: 84 (17.3%) to St. Mary's, 225 (46.22) to other London medical schools, 40 (8.2%) to Oxbridge, and 138 (28.3%) to other Non-London medical schools.

Academic qualifications.

Academic qualifications are of great importance in selection of students for university, both by voluntary choice on the part of the individual universities and colleges, and also in the legalistic sense that UCCA stipulates that no one may enter a university unless they have satisfied certain minimum matriculation standards. Table 3-1 summarises the 0- and A-level qualifications of all applicants, these being divided into those who were successful and those who were unsuccessful. Many applicants had not taken A-levels at the time of application, or were resitting their exams. Results were obtained from examination boards for all exams taken after application (mostly in the summer of 1981) and Table 3-1 is based on actual results eventually obtained, resit candidates being credited with their best performance in a particular subject. In the case of mature applicants the grades quoted are both those taken a number of years earlier (often in Arts

subjects) and any that might be being taken at the time of application (usually in science subjects). Scores have been calculated on the basis of 5 points for an A grade, 4 points for a B, 3 for a C, 2 for a D, 1 for an E, and 0 for an 0 or F. At A-level most applicants offer sciences (usually physics, chemistry, biology and maths) with only a very few offering arts subjects (and then either a single subject in addition to science, or in the case of mature students, subjects taken a number of years earlier). On average each applicant offered 3.15 A-levels (excluding General Studies), with the vast majority taking three A-levels (81.8%), and a few offering only two A-levels (2.3%), four A-levels (13.8%), or more than four A-levels (2.1%). The grades of successful applicants in general are substantially higher than those of rejections, at both A and 0 level. On average each candidate at 0-level had taken 4.2 science subjects and 5.0 non-science subjects, the vast majority having taken Physics, Chemistry, Biology and Maths, English literature and language, and French. The grades obtained by those accepted were significantly higher than those rejected except in art and music, and in a number of of subjects taken by only a few applicants.

Because of the inevitable correlations between grades in different subjects it is convenient to reduce Table 3-1 to a more compact set of four measures: the number of A-levels taken, the mean grade obtained (using the best grade in the case of resit subjects), the number of 0-levels obtained, and the mean grade attained at 0-level. Together these variables are referred to as educational qualifications (EQ). To a

large extent these measures encapsulate the essence of Table 3-1, although some subtleties may be lost.

In order to simplify interpretation of the findings, only UK nationals are analysed unless specific reference is made. Figure 3-1 shows the cumulative distributions of A-level achievement according to the six destination groups of the applicants. There is a sharp discrimination between the groups, as might be expected: Oxbridge scored higher than other acceptances ($F(1,485)=39.82,p<0.001$); there was no difference between St. Mary's, Other London and Non-London schools ($F(2,444)=1.50$, NS). Those accepted for non-medical courses had significantly higher grades than those rejected overall ($F(1,674)=25.42,p<0.001$). An A-level achievement threshold of 3.1 (i.e. an average grade between a B and a C; or the equivalent of between 9 and 10 points based on three subjects) correctly groups 83.9% of applicants into acceptances and rejections; only 8.4% of acceptances gained less and 22.1% of rejections surpassed it. Although the ability to achieve high A-level grades is clearly very important in selection, these figures show that it is not the only factor which determines selection, nor is there any overwhelming reason why it should be (Simpson, 1972), particularly given public doubts about the nature of the grading system in A-level exams (e.g. Anon, 1984b). Indeed an editorial in <u>Medical Education</u> commented that, "some disillusionment now exists with academic performance and with school credits in particular as the main basis for deciding who is suitable for medical education" (Anon, 1979a). Selection has therefore also been assessed <u>without</u> taking

A-level achievement into consideration, in order to determine
the significance of other factors.

Univariate analyses of non-academic factors.

It is not a simple matter to determine the effects of a
single non-academic variable upon selection. This difficulty
is clearly seen in respect to social class. From Table 3-2
it appears that those of higher social class are
significantly more successful in their applications, while
Table 3-3 appears to show no such bias as St. Mary's.
Neither comparison is valid. Many St. Mary's rejects were
accepted elsewhere, thus reducing the power of the statistics
to detect true bias. More seriously, in Table 3-2, not all
applicants have applied to the same medical schools, and the
selection bias is therefore the aggregate of the individual
biases of all schools. However if the applicants to
different schools differ in their social class, as is likely,
then even if each individual school were completely fair in
its selection, the system as a whole could show an apparent
bias. The corollary is also true. The system as a whole
could be unbiased, but this could be due to exactly half of
the schools being overtly discriminatory, and the other half
being compensatory; to describe such a system as 'fair' would
hardly be acceptable. Finally, it is likely that social
class is itself correlated with success in 0 and A-level
examinations   because   of   different   educational
opportunities, and hence the differences of Table 3-2 could
be entirely explicable in academic terms, and the apparent

fairness of table 3-3 may itself be illusory. The crude
analyses of tables 3-2 and 3-3 have therefore been replaced
with a more sophisticated multiple regression approach which
allows answers to a number of closely related questions about
four distinct aspects of selection, which are called
differential application, systematic selection, differential
selection, and differential acceptances. In so doing it is
conceptually simpler to reverse the questions and ask if one
may predict the social class of an applicant given a
knowledge of other factors about the candidate. The NEW
REGRESSION procedure of the SPSS statistical program (Nie et
al, 1975; Hull and Nie, 1981) has been used for statistical
analysis.

The following questions may be asked:-

i.) Are there differences between schools in their
applicants? ('differential application'). The process of
medical student selection by schools is complemented by the
process of medical school selection by students (and often
the crieria used by the latter are not those expected by the
former - Roath et al, 1977). This second process I have
called differential application, although in fact it has two
distinct stages: i.) choosing five medical schools for the
UCCA form, and ii). choosing from those schools who make
offers. The two are necesarily combined in the analysis that
follows.

From the St. Mary's data one may calculate for each medical school the mean social class (or any other parameter) of all those St.Mary's applicants who included that particular university on their UCCA form. Of course this will not produce an accurate estimate of the actual mean social class of <u>all</u> applicants to that school, but rather only of that subset that included St.Mary's on their UCCA form. Nevertheless such an analysis will allow us to estimate the <u>relative </u>pattern of social class differences between medical schools, and will be valid unless there are very unusual interaction patterns. For descriptive purposes one may combine these estimates into different types of school (the same groups as previously, except that Non-London has been further sub-divided into 'England and Wales' (E&W) and 'Scotland and Northern Ireland' (S&NI)), the scores of each school being weighted by the total number of applicants to that school.

It is not possible to calculate standard errors for such means since they are not combinations of independent estimates, some candidates applying to several universities within each group. The St. Mary's sample comprised 120 UK applications to Oxbridge, 3137 to other London schools, 1221 to English and Welsh schools, and 155 to Scottish and Northern Irish schools, and 1183 applicants to St. Mary's itself. In order to carry out statistical tests I have introduced into the multiple regression procedure a series of dummy variables, consisting of the number of universities applied to by each candidate in each medical school group. By entering these variables simultaneously into the

regression, after total number of UCCA applications and total medical school applications have already been entered, then a significant increase in the explained variance indicates the presence of differences between medical school groups. If overall differences are significant then the source of the difference is found by considering the confidence limits of the coefficients of each of the individual variables.

ii.)Is there any overall bias in the system? ('Systematic selection').

Having carried out the analysis in step i.) one may now find the statistical improvement obtained by adding in a variable indicating whether or not an applicant was accepted by any medical school. This tests whether <u>overall</u> there is a systematic trend in the selection system after differences in application pattern are taken into account; whether or not such trends are construed as bias will depend upon assessment of their relevance to the selection process.

iii.) Are there differences between schools in the way in which they select students from those who apply to them? ('Differential selection').

If after step ii.) one adds in extra variables which indicate acceptance by any one of the schools within each of the five groups, and obtains a significant improvement in the fit of the regression model, then there is evidence for heterogeneity in the selection methods of different medical

school groups. **The** source of the heterogeneity may be found by examining the standard errors of the regression coefficients of the additional variables. To my knowledge, only one study has ever explicitly considered such a possibility, Shuval (1980; p.60) finding differences between Israeli medical schools in their over-selection of the children of doctors.

iv.) <u>Are there differences between medical schools in the individuals that they accept? ('Differential acceptance').</u>

One may answer this question by fitting a series of variables as in iii.) above to just those applicants who are accepted for a medical school; a significant result indicates that medical students differ according to the particular medical school group that they are attending.

v.) <u>Does the variable under consideration relate to 0- and A-levels. and if so. can this relationship account for the results described in i to iv above?</u>

Having obtained answers questions i.) to iv.) it should now be clear that any of these questions may be reassessed after entering EQ (or indeed any other variables or combinations of variables) into the multiple regression; the significance of that first step indicates whether the variable in question is related to educational qualifications, and subsequent steps analogous to i.) to iv.) above qualify the answer to these questions, by taking

differences in educational qualifications into account.

Each of the above questions may now be considered in relation to different sets of variables.

1.) Educational qualifications.

Figure 3-2 shows the O and A-level qualifications of applicants to and acceptances by the medical schools in the five groups.

Number of O- levels taken. Applicants differed: Oxbridge applicants took more, and S&NI applicants took fewer 0-levels ($p < 0.001$). Acceptances had significantly more 0-levels than rejects ($p < 0.001$.) There was no evidence that schools differed in the emphasis that they placed upon number of 0-levels taken (i.e. no differential selection) and there was no evidence that acceptances by different schools differed in their number of 0-levels (i.e. no differential acceptance).

Mean grade in 0-levels. Applicants to schools differed in their average 0-level grade ($p < 0.001$), almost entirely because Oxbridge applicants had higher grades. Acceptances had significantly higher grades than rejections ($p < 0.001$). There was no significant evidence of differential selection. Significant evidence of differential acceptance ($p < 0.001$) was entirely attributable to Oxbridge acceptances having higher grades.

Mean number of A-levels taken. The only evidence of differential application ($p = 0.051$) was that Oxbridge applicants had taken more A-levels. Overall there was

evidence for systematic selection, and only marginally significant evidence (p=0.064) of differential selection, which was due to St.Mary's accepting applicants with higher numbers of A-levels. The differential acceptance (p<0.001), was attributable to both Oxbridge and St. Mary's entrants having more A-levels.

Mean grade in A-levels. The difference in average A-level grades between applicants and between entrants to different schools (p<0.001 for each), was almost entirely due to Oxbridge applicants having higher grades. Overall there was highly significant evidence for systematic selection in favour of high A-level grades. (p<0.001). There was no evidence for differential selection.

A-level maths taken. 39.2% of applicants and 43.7% of acceptances had taken A-level maths. Figure 3-2e shows that there is differential application (p<0.001), primarily due to more Oxbridge applicants having taken maths. Taking A-level maths did not relate to overall likelihood of acceptance, nor was there evidence of differential selection or differential acceptance. A-level maths related to EQ (p<0.001); those who took maths had taken more A-levels and achieved higher grades. Taking account of EQ reduced the significance of the differential application (p<0.05) but otherwise did not alter the above conclusions.

A-level biology taken. 78.3% of applicants and 74.4% of acceptances had taken A-level biology. Figure 3-2f shows no evidence for differential application, although there was a trend towards systematic selection (p=0.054) against biologists, but this was explained entirely by the lower mean

A-level grades **of** those including biology in their A-levels (p<0.001). There is no evidence for differential selection or differential acceptance.

2.) Demographic factors.

i.) Nationality. 178 (13.1%) of the applicants to St.Mary's were not of British nationality, as determined from their UCCA form. In contrast only 5.8% of acceptances were not British. There was marginally significant evidence of differential application (p<.1) (Figure 3-3a), highly significant evidence of systematic selection (p<0.001), and no evidence for differential acceptance. Being non-UK related significantly to lower EQ. (p<0.001). Taking account of EQ increased the significance of the differential application (p<0.05), reduced the significance of the systematic selection (p<0.05), and did not alter any other conclusions.

In view of the educational and other differences between UK and non-UK applicants, the remaining analyses are confined to applicants of UK nationality.

ii.) Sex. 37.5% of applicants and 40.3% of acceptances were female. Figure 3-3b shows that any tendency to differential application is not significant. Nor is there evidence for systematic selection, differential selection or differential acceptance. Overall, sex related to EQ: women applicants had higher 0-level grades but lower A-level grades, but the above conclusions were not altered when these differences

were taken into account.

iii.) <u>Social class.</u> This has already been discussed earlier. There was evidence for differential application (Figure 3-3c), because applicants to Oxbridge and London were from a higher social class background. After taking such differential application into account, acceptances were of higher social class than rejections (p<0.05). There was no evidence for differential selection, although there was significant evidence for differential acceptance (p...018). The pattern of differences between schools is almost identical to that found by the Royal Commission on Medical Education (1968), for applicants entering medical school in 1961 and 1966, and for the more recent study of Donnan (1975). Class related significantly to EQ (p<0.001); those of higher social class had higher 0-level achievement, but there were no significant differences in A-level achievement. When EQ was taken into account, the differential application was still significant, the systematic selection became non-significant, and the differential acceptance became more significant (p=.008).

iv.) <u>Medical family.</u> Candidates were classified as coming from a medical family if there was any evidence, either from the UCCA form or questionnaire Q1, that either parent was medically qualified. 17.1% of applicants and 19.9% of acceptances came from a medical family. Figure 3-3d shows that there are relatively small differences between the applicants to different medical schools (p=.064), with the majority of the differences being due to a higher application rate at Oxbridge. There was no significant evidence

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systematic selection (p=.102), or differential selection. St. Mary's and E&W had a lower proportion of individuals from medical families (p=0.035). Medical background related significantly to EQ (p=.016): those from medical families had taken more 0-levels and fewer A-levels than other applicants, although average grades were similar. Taking EQ into account, applicants still differed between schools (p=.051), there was a trend towards systematic selection (p=.066) but no evidence of differential selection.

v.) Maturity of applicants. 'Mature' applicants were defined as those who would have reached the age of 21 by 30th September 1981 (i.e. the beginning of the 1981-1982 academic year). 14.8% of applicants and 8.3% of acceptances fitted into this category. Figure 3-3e shows a highly significant differential application (p<0.001) and differential acceptance (p<0.05) most of the effects being due to their lower application rate to Oxbridge. Mature students were less likely to be accepted (p<0.001) overall, although there was no evidence for differential selection. Mature applicants had significantly lower 0- and A-level achievement (p<0.001). Taking these differences into account, schools still differed in their proportions of mature applicants (p<0.05), but there was now no evidence for systematic selection (p=.61), and still no evidence of differential selection.

i.) Region of domicile. Applicants were divided into those from the north or south by means of a line drawn between the Mersey and the Humber, along the northern boundaries of Lincolnshire, Nottinghamshire, Derbyshire, Staffordshire,

Shropshire and Clwyd, and including Scotland and Northern Ireland. Not surprisingly S&NI schools received a higher proportion of northern applicants (p<0.001), and they were also more likely to accept northern applicants (p=.027) (Figure 3-3f). Applicants from the north had a slightly higher 0-level achievement related to EQ (p=.042) but taking account of this did not affect the above conclusions.

3. <u>Education.</u>

   i. <u>Private versus Public Sector education.</u> Applicants were classified according to whether they had received any education in the private sector (i.e. independent public schools, direct grant schools, private schools, or tutorial colleges); 47.5% of applicants and 51.1% of acceptances had had some private sector education. Figure 3-4a shows differential application (p<0.05), with Oxbridge having a higher proportion of private sector applicants. Taking application patterns into account there was no overall evidence of systematic selection (p=.16), differential selection, or differential acceptance. A private sector education correlated very significantly with EQ (p<0.001), a result almost entirely due to having taken more 0-level subjects. Taking EQ into account produced no change in the above conclusions.

<u>ii.) School size.</u> Neither overall school size, size of sixth form, or number in sixth form going to university each year, affected the patterns of application or acceptance (figures 3-4b, 3-4c, and 3-4d). Applicants from large schools tended

to take more A-revels (p<0.01), applicants from larger sixth forms tended to have higher A-level grades (p<0.1) and applicants whose schools sent more students to university tended to have higher A-level grades (p<0.1.) Taking EQ into account did not alter any of the above conclusions.

The <u>UCCA application.</u>

<u>i.)</u> <u>Oxbridge on the UCCA form.</u> 10.3% of applicants and 20.3% of acceptances had included Oxford or Cambridge on their application form. Figure 3-5a shows the proportions of applicants to schools who had included Oxbridge on their UCCA form (Oxbridge itself being excluded since necessarily all applicants and acceptances had put it on the form). Although differential application was not significant, there was significant evidence for systematic selection (p=0.01), and a trend towards differential selection. Oxbridge application correlates highly with EQ (p<0.001), these applicants having taken more 0 and A levels, and gained better grades in those 0 and A levels. Taking EQ into account there was no evidence of differential application, and there remained only a trend towards systematic selection (p=.086).

<u>ii.)</u> <u>The number of London schools on the UCCA form.</u> Figure 3-5b shows the number of London schools included on the candidate's UCCA form. On average applicants had included 3.65 London schools (including St.Mary's) and acceptances had included 3.48 London schools. There was no evidence that it was an advantage to combine applications to London schools. Candidates applying to more London schools had lower 0-level

achievement (p<0.001.) Taking this into account did not affect any of the above conclusions.

iii.) The use of bracketing on the UCCA form. Candidates may use one or two brackets around their five UCCA choices to indicate equal preference of choices. As a single measure of this the preferential position after taking account of bracketing of the choice that was actually in the fifth position on the UCCA form was used; thus if no brackets were used then the last choice was truly fifth in order of preference and a score of 5 was given, while if all five choices were bracketed together a score of 1 was given, since the last choice was actually first equal. On average applicants had a score of 4.06 and acceptances had a score of 4.20. Figure 3-5c shows that there are significant differences between applicants to different schools in their use of bracketing (p<0.001), applicants to Oxbridge using less bracketing (necessarily, by UCCA rules) and London applicants tending to use more bracketing. Overall there was a trend (p<0.1) towards acceptances using fewer brackets than rejections, and there was no evidence of differential selection or differential acceptance. Applicants using more brackets tended to have lower O- and A-level achievements. Taking EQ into account reduced the significance of the differential application (p<0.01), and removed any systematic disadvantage in selection (p=.92).

iv.) Post-A-level application. 36.6% of applicants and 39.0% of acceptances were post-A-level (defined as having already taken two or more A-levels at the time of the UCCA application).   Differential application was highly

significant (p<0.001), with Oxbridge applicants being more likely, and E&W applicants less likely to be post-A-level. There was no evidence for systematic selection or differential selection. Differential acceptance (p<0.05), was almost entirely due to Oxbridge taking more post-A-level applicants. Post-A-level applicants had poorer 0-level achievement but better A-level achievement (p<0.001). Taking account of EQ did not remove the differential application (p<0.001), or affect any other results.

v.) Previous UCCA application. 21.3% of applicants and 22.6% of acceptances had applied to UCCA previously. Figure 3-5e shows that schools differed in their proportion of previous UCCA applicants (p<0.05), due mainly to Oxbridge and E&W receiving fewer such applicants. There was no evidence of systematic selection, differential selection or differential acceptance. Previous UCCA applicants had lower 0-level achievement but higher A-level achievement (p<0.001). Taking these differences into account did not affect any of the above findings.

vi.) Date of UCCA application. The mean date of receipt of applications at UCCA was October 24th, whilst the mean date of receipt of forms from acceptances was October 15th. Figure 3-5f shows that schools differed in the date of receipt of their applications (p<0.001), in part due to UCCA requiring that Oxbridge applications be submitted by October 15th. Overall successful applicants applied earl ier (p<0.001). There was no evidence for differential selection. Acceptances showed differences between schools in their date of application (p<0.001), a result which is not entirely

accountable by earlier Oxbridge applications. Date of application correlated very significantly with EQ (p<0.001), early applicants having higher O- and A-level achievement, although these differences did not remove the differential application (p<0.001), or the systematic selection (p<0.01.)

Multivariate Analyses.

i.) UK applicants.

Univariate analyses have shown that a large number of factors show some of the four processes of differential application, systematic selection, differential selection or differential acceptance. However many of these variables are themselves inter-correlated (for instance being from social class I, having a medical parent and going to a private sector school are all positively inter-related). To determine which factors best discriminate between successful and unsuccessful applicants, one may use the multivariate technique of multiple logistic regression. The effects of 24 background variables were examined simultaneously. Table 3-4 shows the mean and SD (or percentage for binary variables) in UK applicants and rejects, and the result of a univariate significance test (unpaired t-test or chi-squared test) for differences between the two groups. The effect of the 24 background variables upon the likelihood of acceptance was analysed by a multiple logistic regression (McCullagh and Nelder, 1983), using the GLIM computer package (Baker and Nelder, 1978), the dependent variable being whether or not

the applicant was accepted at <u>any</u> medical school. Considering just the 946 UK applicants with complete data on all variables, the prediction equation based on all 24 variables was highly significant (Chi-squared = 601.5, 24df, p<<0.001). Table 3-4 shows for each variable the effect upon the relative likelihood of acceptance, the variables being ranked from most significant to least significant. Only the first six variables reach the conventional 5% level. Taken together the last 18 variables do not significantly improve the fit of the regression equation (Chi-squared = 12.4, 18df, NS). Table 3-4 shows 95% confidence limits of the relative likelihood for those variables which are statistically significant .

Four of the six significant predictors are concerned with educational qualifications, and these are dominated by the mean A-level grade, an applicant with one grade higher on average having increased his likelihood of acceptance by eight times. These educational qualifications are themselves determined by background variables and therefore factors predicting success at the educational qualifications have been examined. Of the other two predictors of success, the date of application to UCCA is also determined by many background factors, and will be analysed further below. The sixth predictor, coming from a medical family, did not seem capable of fur ther breakdown in this manner.

ii). Non-UK applicants.

Thus far all of the analyses reported have been on those with United Kingdom nationality. A multiple logistic regression was carried out using the six significant predictors shown in table 3-4, and with the addition of UK nationality as a seventh predictor. After taking the six known predictors into account, UK nationals were 4.44 times as likely to be accepted as non-UK nationals (p<.001; 95% confidence limits 2 .09x to 9.45x) . There were no interactions between UK nationality and the other six predictors (Chi-squared 7.2, 6df, NS).

Determinants of educational qualifications.

The average A-level grade obtained by applicants can be determined, in principle, by many factors; previous examination results, the particular mix and number of subjects being taken; the school size and type; and the family and other background variables. The method of causal modelling (Kenny, 1979) has been used to estimate the effects of factors which are felt to determine subsequent variables. Figure 3-6 shows the 13 variables. The method of analysis assumes that any variable to the left of a particular variable could be a cause of that variable, with precedence being given to those variables which are closest together. Estimates of effects were found by multiple regression (Kenny, 1979), using the NEW REGRESSION program of the SPSS package (Hull and Nie, 1981). Figure 3-6 shows all causal links which are significant at the 5% level.

From figure 3-6 it can be seen that the four measures of educational qualifications are all dependent upon background variables and upon each other. Private sector education ("Public schools") is more likely in those from social class I and those from medical families. Private sector schools are smaller, and have smaller sixth forms relative to overall school size. Sixth form size has no influence upon A-level results, but pupils at larger schools overall tend to take more A-levels (but not gain higher grades in them). The number of 0-levels taken is higher at private sector schools, and those taking more 0-levels also get higher grades at 0-level. Grades attained at 0-level determine whether maths or biology is taken at A-level, higher achievers taking maths rather than biology. The average grade at A-level is not related to the number of A-levels taken, but is higher in those taking maths and lower in those taking biology. Higher grades at 0-level, and having taken more 0-levels also predict subsequent A-level grades. The sexes differ in that females tend to obtain higher 0-level grades but lower A-level grades   (after taking   0-level

    performance into account). Social class influences the type of schooling attended; those from social class I also tend to take more 0-levels and to obtain higher grades in them. Those who come from a medical family tend to obtain lower 0-level grades, and are more likely to take biology at A-level. Candidates from the north of Britain obtain higher 0-level grades, but tend to take fewer A-level subjects.

From this analysis it can be seen that although A-level grades are the immediately proximate determinants of acceptance, they are themselves subject to many causal influences throughout the process of secondary education, and that background variables affect them in many ways. Of course the analysis of figure 3-6 considers only those individuals who actually applied to medical school. It is conceivable, although not likely, that the structural determinants of educational success are different in those who might apply to medical school, but in fact have not.

Determinants of date of UCCA application.

Causal modelling was not felt to be useful for analysing the date at which applicants applied to UCCA since no clear <u>a priori</u> ordering of variables could be determined. Results were therefore analysed by a forward entry multiple regression, variables being entered into the multiple regression equation such that at any step the variable entered had the greatest prediction of UCCA date from those variables not yet in the equation, taking account of the variables already in the equation. 19 variables were used, all of those mentioned earlier, with the exception of the four measures of 0- and A-level achievement (which were not felt to be of direct interest since they already had an independent prediction of success at application).

Early UCCA application was predicted by five of the background variables (multiple R = 0.368, p<<.001) (see Figure 3-7). Oxbridge applicants applied 18.9 days earlier (p<.001) (due in large part to UCCA rules about Oxbridge applicants). The number of medical schools on the UCCA form related to date of application, each extra medical school on the form being associated with an application 11.4 days earlier (p<.001). Female applicants applied 6.8 days earlier (p<.001), and mature applicants applied 15.8 days later (p<.001), and applicants from the north of Britain applied 6.0 days later (p<.005). After taking all such effects into account, average 0- and A-level grades also predicted date of application, each average grade at A-level being associated with a 2.9 day earlier application (p<.001), and each grade at 0-level being associated with a 4.3 day earlier application (p<.05). Thus 0- and A-levels have a double effect upon the likelihood of acceptance, directly, and indirectly via date of application. Oxbridge applicants tended to have significantly higher 0- and A-level grades, to take more A-levels, and to be male. Mature applicants tended to have significantly lower 0- and A-level grades, to have taken less 0-levels, and more A-levels, and to have come from larger schools. The number of medical schools chosen on the UCCA form was significantly higher in applicants from medical families.

Figure 3-7 summarises the direct and indirect influences upon selection.

<u>Discussion.</u>

By far the **most important** factor determining selection
is the grade at A-level. The widespread opinion that
academic qualifications should be only a partial factor in
selection (Bennett and Wakeford, 1982, 1983; Crisp, 1984;
Linke <u>et al</u>, 1981; Parkhouse, 1979) may be to some extent
justified by the generally poor predictive value of A-levels
for subsequent university (Bagg, 1970; Entwistle and Wilson,
1977; Choppin et al, 1973), and medical school performance
(Savage, 1972; Mawhinney, 1976; Tomlinson et al, 1977;
Richardson, 1980), which rarely produce correlations
accounting for more than 10% of the variance in medical
school examinations (although as Guy (1984) has pointed out,
that may in part be due to the inaccuracy of grade assignment
at the very close boundaries between grades B,C and D,
despite apparently very high correlations between markers
(Murphy, 1978; 1982)). Similarly poor correlations have been
found in America (Bloom, 1973; Rippey <u>et al</u>, 1981; Herman
and Veloski, 1981; Jones and Thomae-Forgues, 1984), in
Australia (Lipton <u>et al</u>, 1984), and in Israel in the so-
called 'Beersheva experiment', in which a wide-ranging non-
traditional' selection was used, and hence a wide-range of
pre-entry examination results was found (Hobfoll and
Benor, 1981). The fact that recent increases in A-level
requirements for studying medicine (McManus, 1982a) means
that a substantial proportion of those currently practicing
medicine would not have been able to get into medical school
at present, has also raised concern about the utility of
selection by A-levels. Such doubts do not however

necessarily either mean that a proportion of those currently entering medical schools are <u>unsuitable</u> for medical practice, or that those individuals currently practicing are not as professionally competent as could be wished or obtained. The greatest practical advantage of selection based primarily on A-level grades, is that it is less likely to be biased by irrelevant social considerations.

Other factors predicting selection, in particular the type of school attended and the presence of a medical parent, are important in so far as they undermine public confidence in the fairness of the system, but their numerical effect appears to be relatively small. Of the other important factors, the inclusion of number and grade of 0-levels is worrying in so far as the predictive value of 0-levels for subsequent medical practice is likely to be minimal, and any effect due to their correlation with A-level success has already been taken into account in the analysis. The role of date of UCCA application needs careful thought since the implication is that a race is taking place in which some runners start before others, and thus an element of gamesmanship enters into the likelihood of successful

application.

A number of background factors, such as type and size of school, sex, and social class, do not have direct effects upon selection, but have indirect effects via factors such as educational qualifications and date of application to UCCA, and therefore may confer indirect advantage upon some candidates. Of course such effects are outside the control

of medical schools. In interpreting these findings it must be remembered that there are many factors which this study does not consider. It looks only at biases arising after the UCCA form has been submitted. However a myriad of factors can bias that process of application, arising from school, home or peer group (Mortimore and Blackstone, 1982), and convincing some potential applicants that it not worthwhile either applying for admission, or even perhaps studying appropriate 0- and A-level subjects. As a Lancet editorial put it, "When the student chooses which medical school he will apply to, only then do selectors begin to have any direct say" (Anon, 1974). That such bias is likely to be occurring can be inferred from the social class distribution of applicants, which is more exclusive than would be predicted if intellectual ability were the sole determinant of ability to study and practice medicine (McManus, 1982b), and on the basis of other studies of university admission in general (e.g. Halsey et al, 1980).

Figure 3-1: The cumulative distribution of mean A-level grade, according to the eventual destination of applicants.

Mean A-level Grade
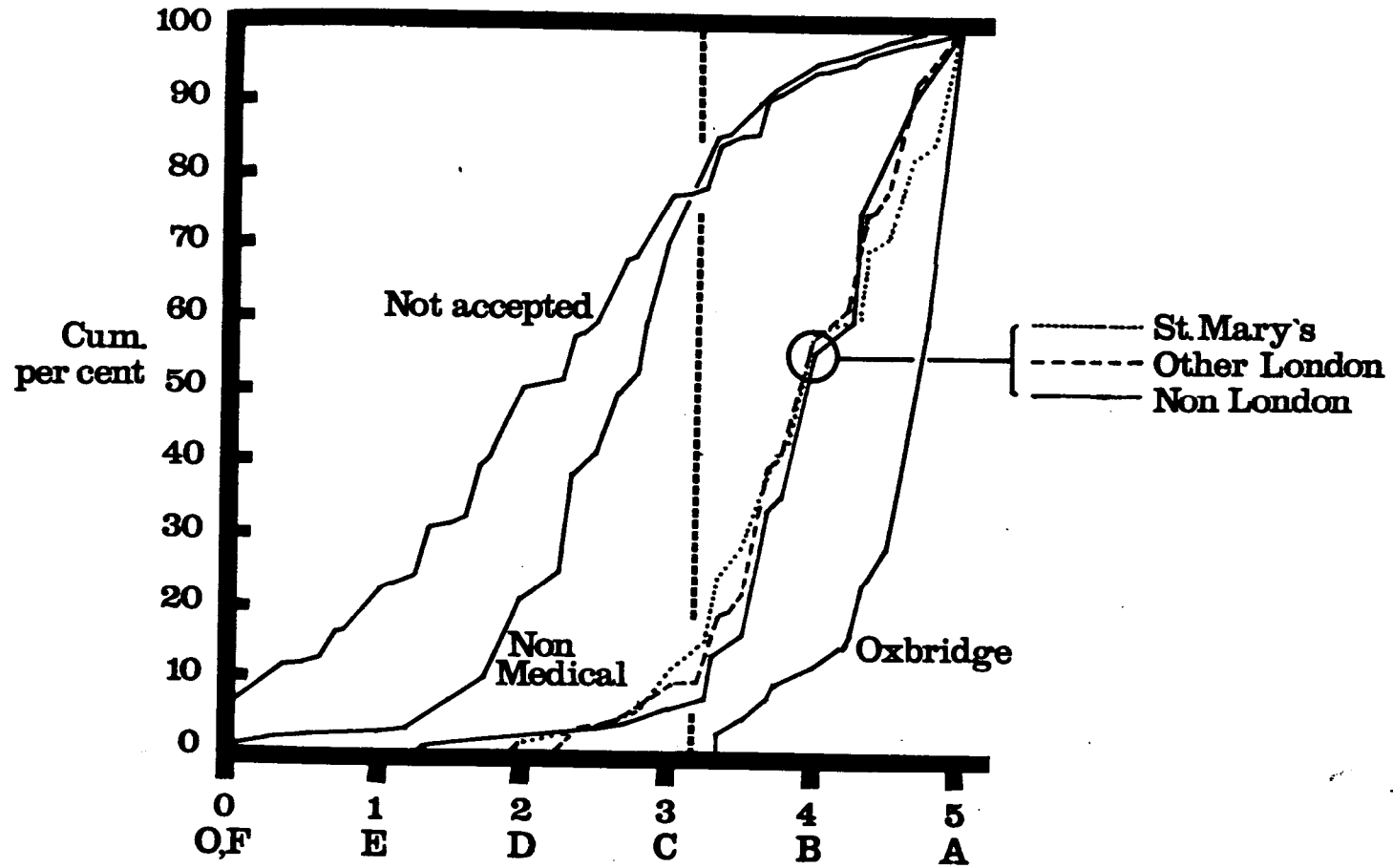
Figure 3-2: Shows the mean number of exams taken (top row) and average grades obtained (middle row), at 0- and A-level, and the proportion (bottom row) taking A-level biology and A-level maths, by applicants (open triangles) and acceptances (solid triangles) to five medical school groups (OC: Oxford and Cambridge; SM: St. Mary's; L: Other London medical schools; EW: Other England and Wales medical schools; SNI: Scottish and Northern Ireland medical schools).

O-levels

A-levels

3.5

Acc.

App.

3.

5

Mean O-level grade

Mean A-level grade

4

3

A-level biology

A-level maths

60

50

40

30

2
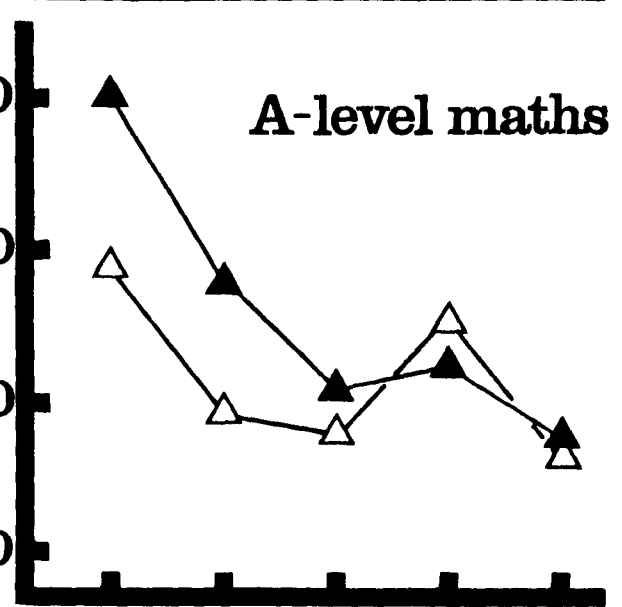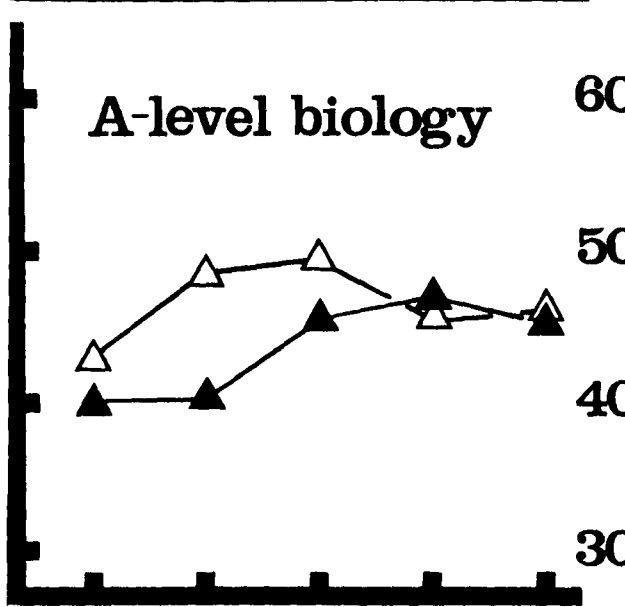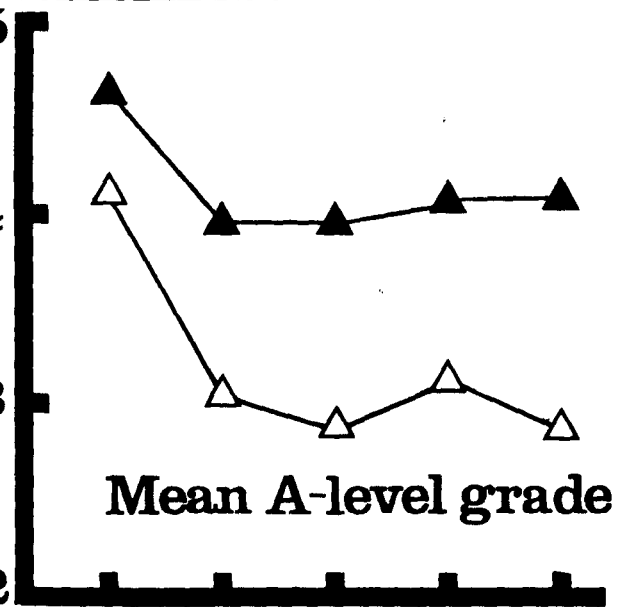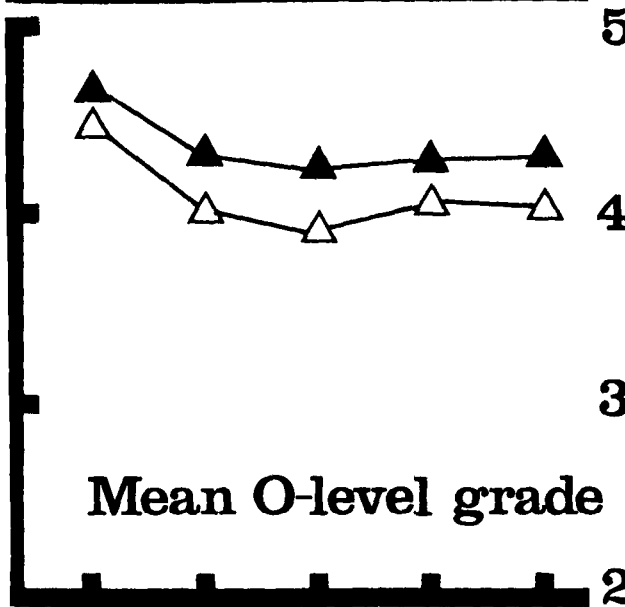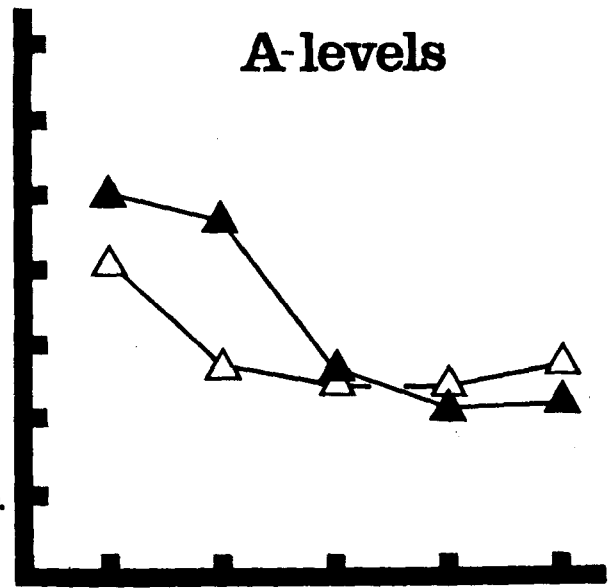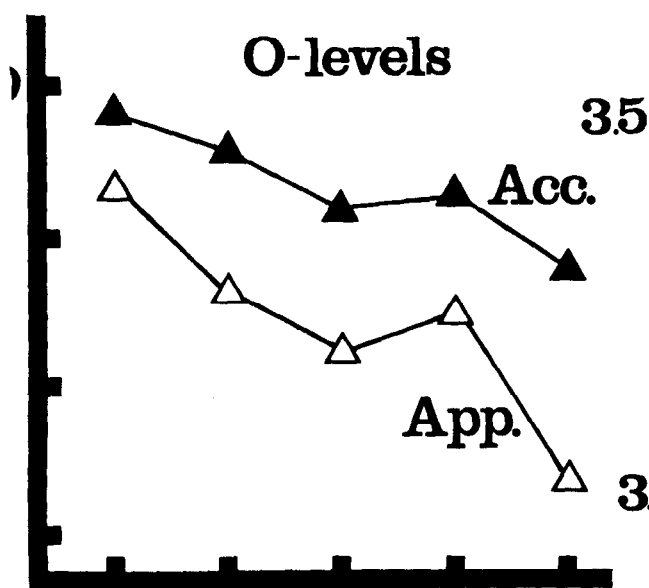
OC SM L EW SNI

OC SM L EW SNI

Figure 3-3: As for figure 3-2 except that the variables are the six demographic factors described in the text.

Non UK

Female

45
40
35
30

Class

Medical family

30
20
10

Mature

`North´

60
40
20
0
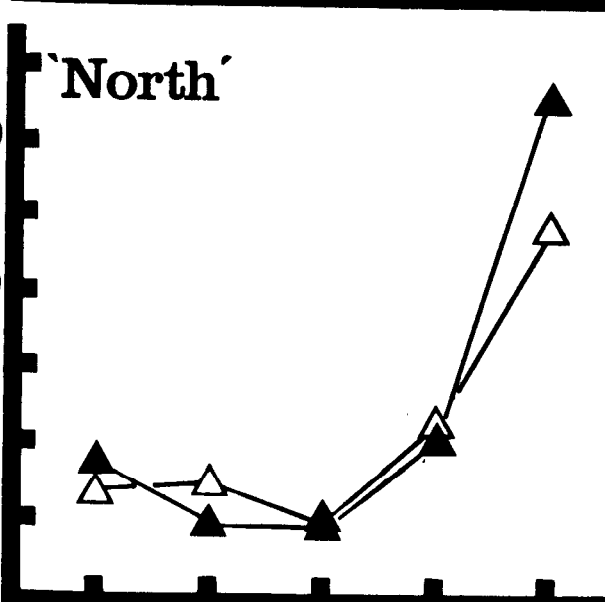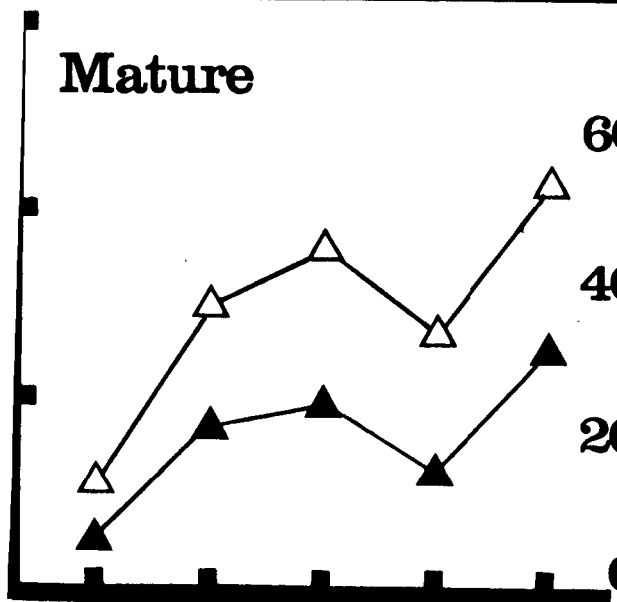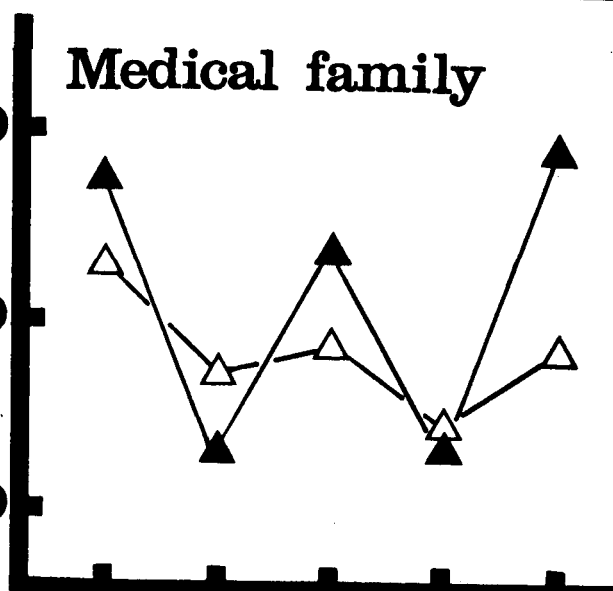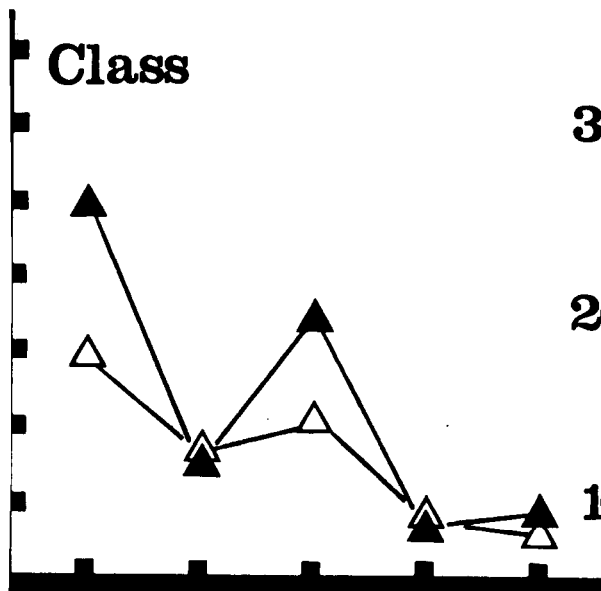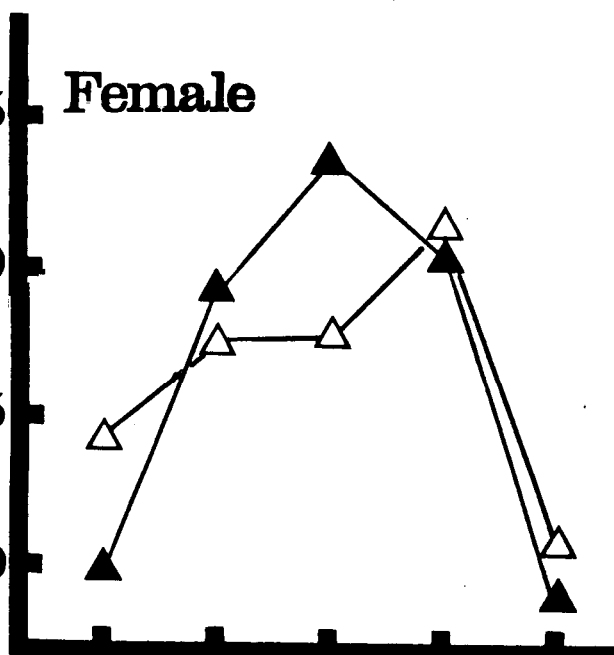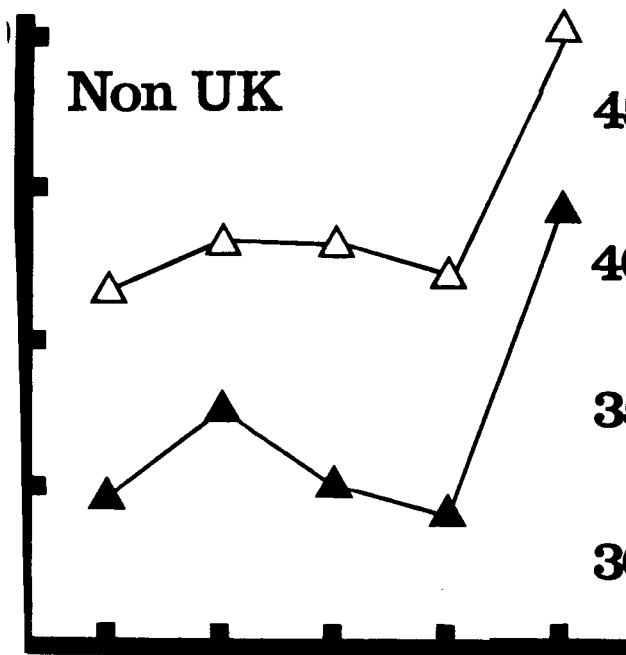
OC SM L EW SNI   OC SM L EW SNI

Figure 3-4: As for figure 3-2 except that the variables are the four descriptions of school type, as described in the text.

Private sector ed`n

900

600

Total school size

Sixth form size

70

N to university

60

50

OC SM L EW SNI   OC SM L EW SNI

146
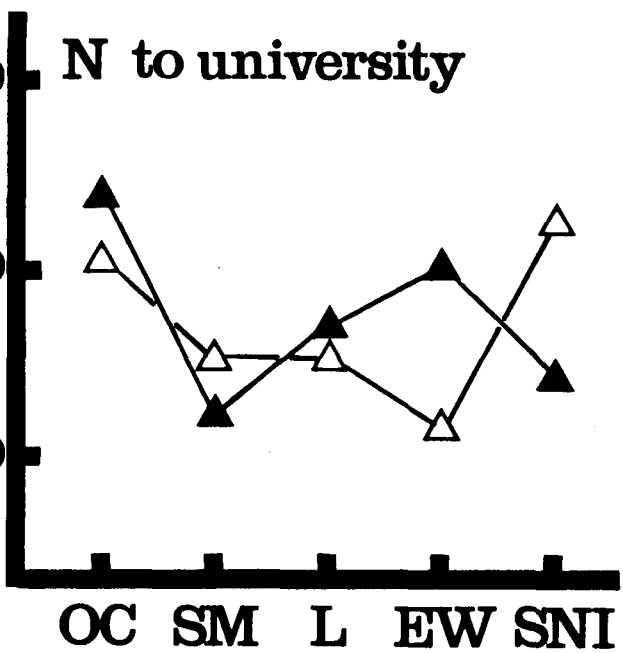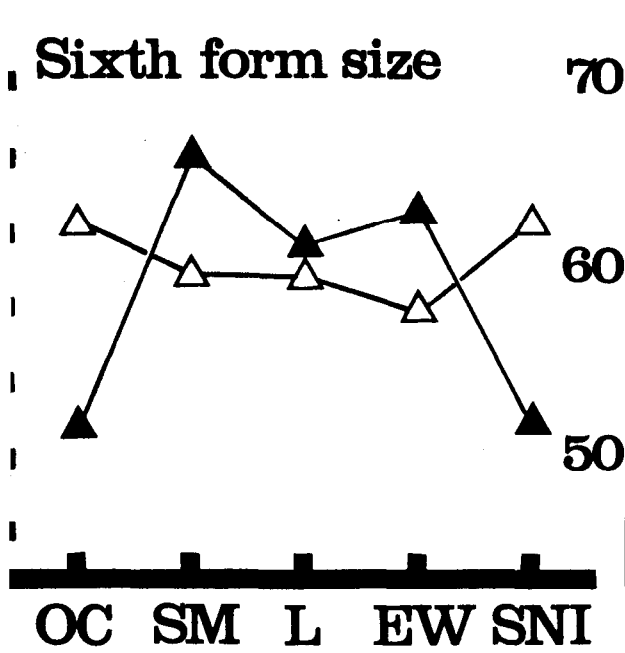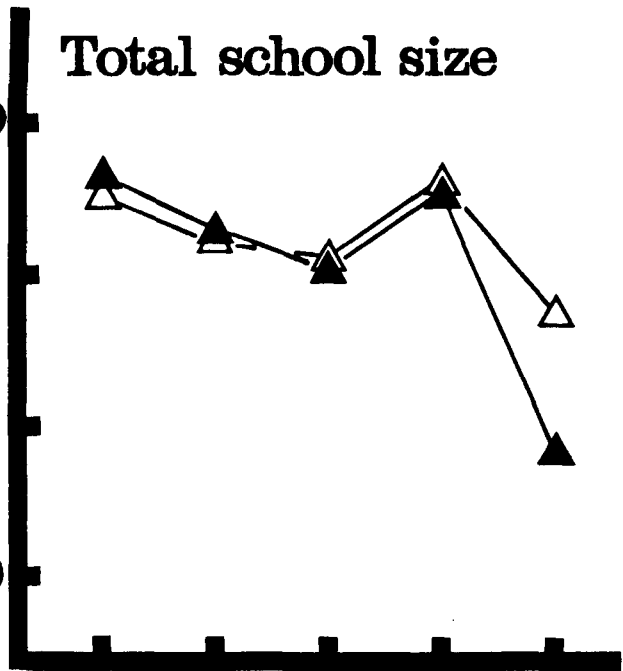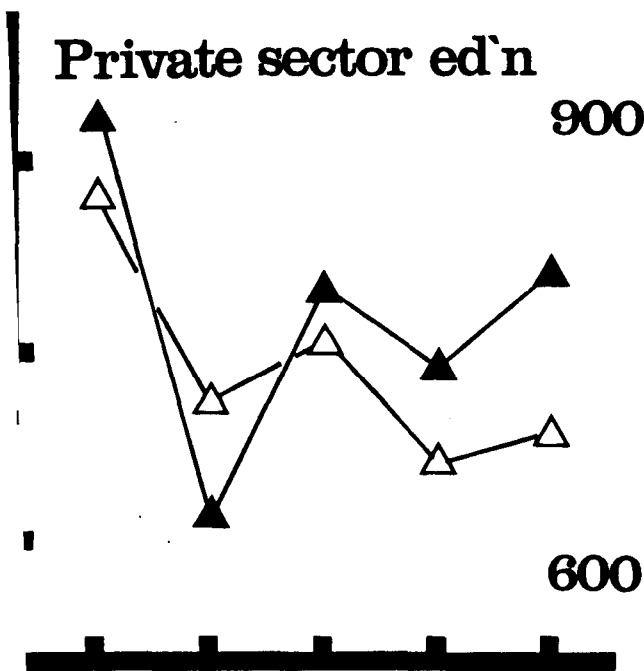
Figure 3-5: As for figure 3-2 except that the variables are the six UCCA form variables as described in the text.

Oxbridge app's

N London app's

Brackets on form

Post A-level

Previous UCCA app.

Date of app'n.

OC SM L EW SNI   OC SM L EW SNI

146
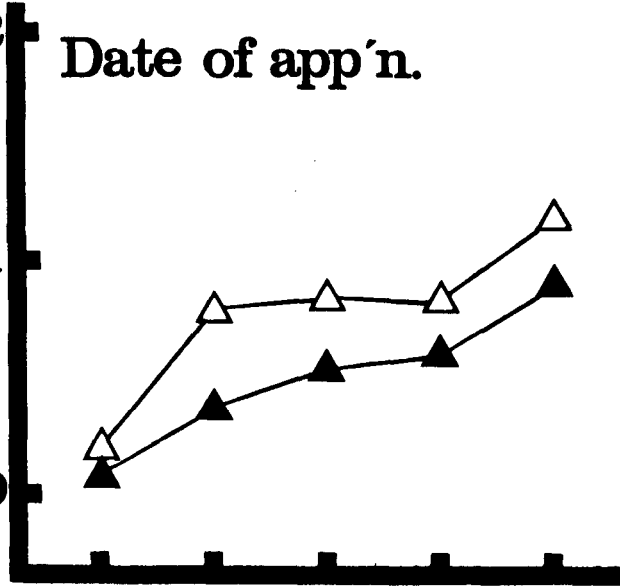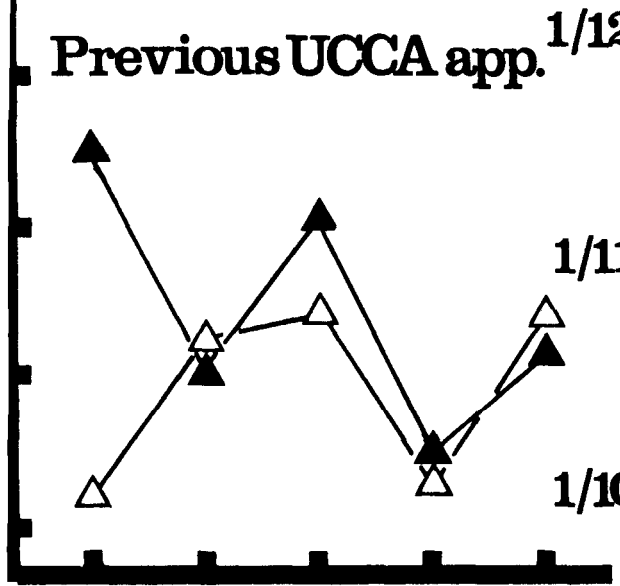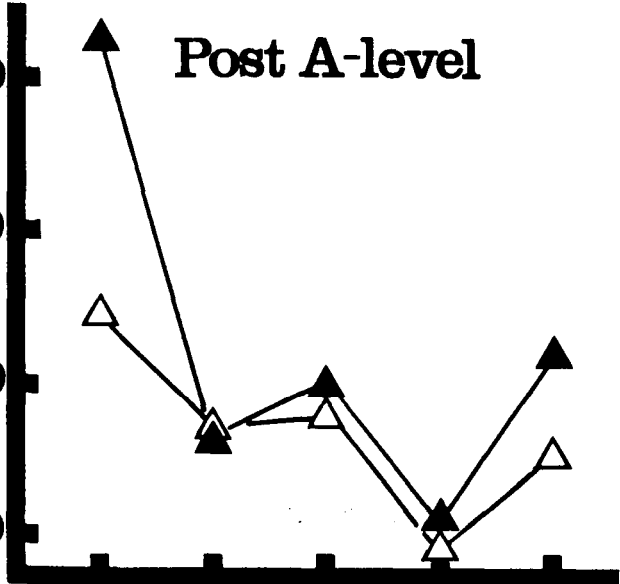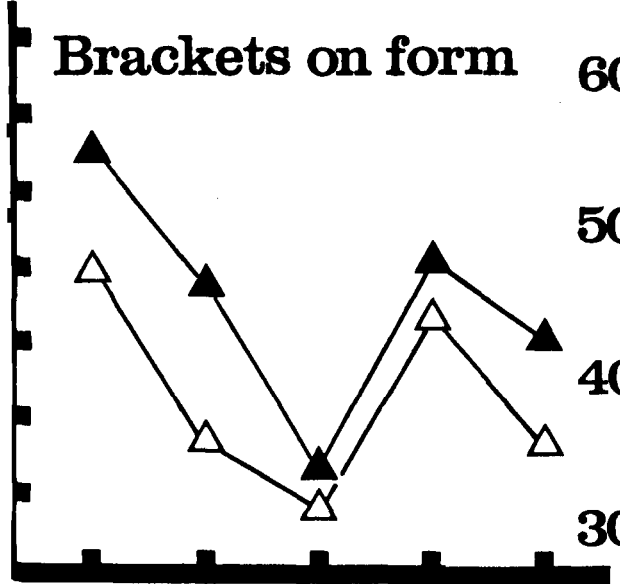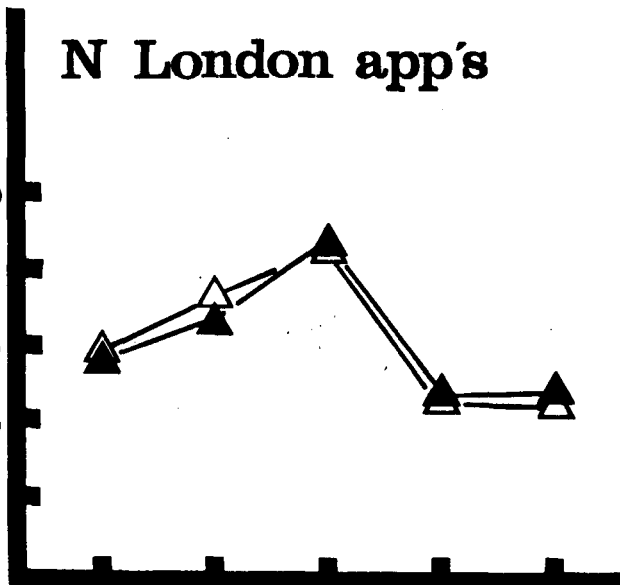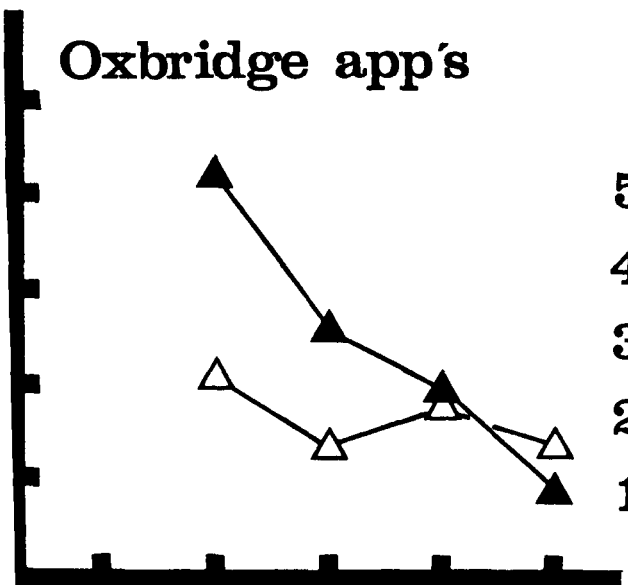
Figure 3-6: Shows a causal model of influences upon 0- and A-level achievement. Causal influences are presumed to act from left to right, and all links are shown which are significant at the 5% level. Values above the arrows indicate the standardised (beta) coefficients. Positive effects are indicated by solid lines, and negative effects by dashed lines. It should be noted that since in the Registrar-General's schema higher social classes are indicated by lower numbers, that the signs of class effects should be interpreted with care.
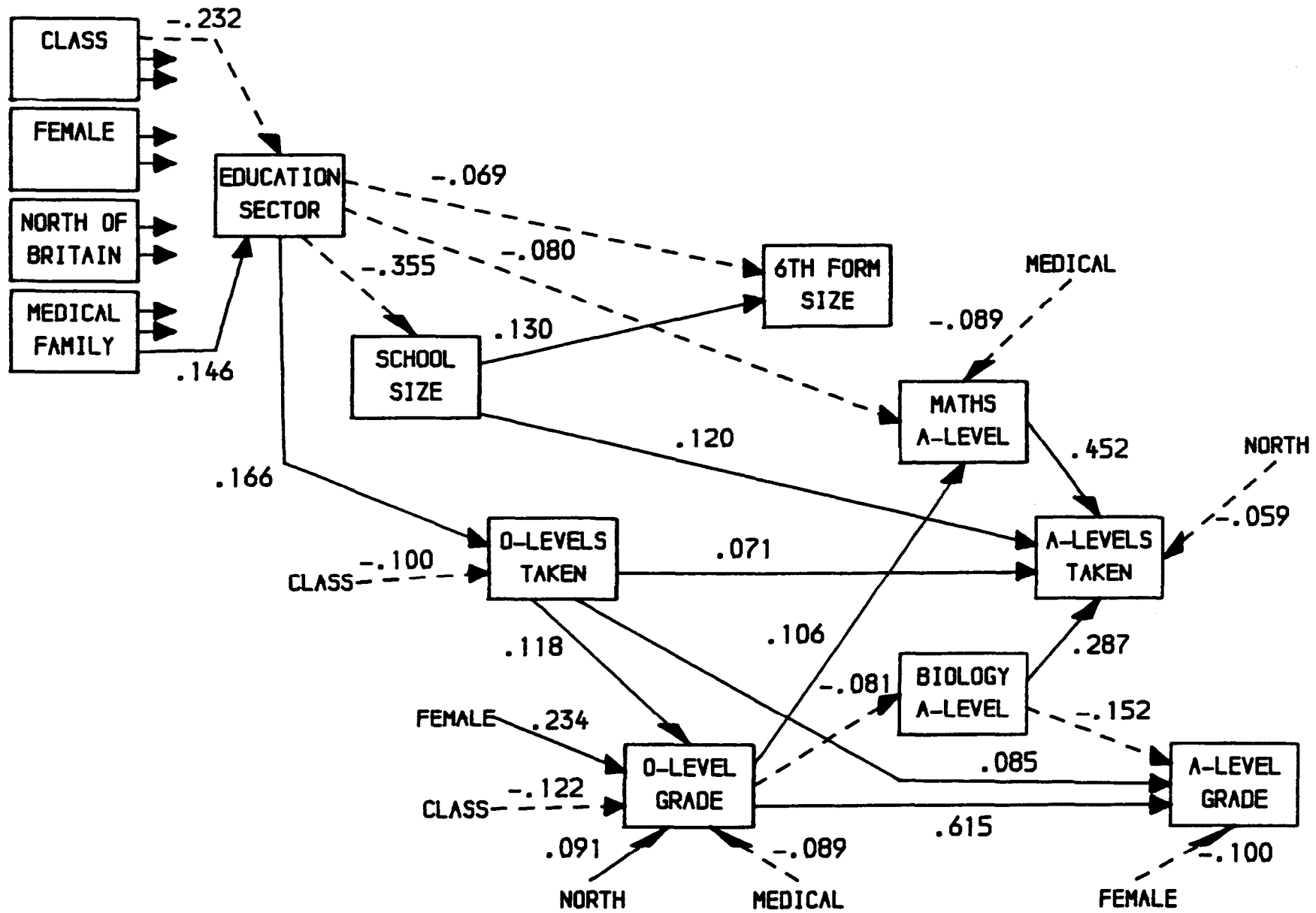
Figure 3-7: Shows the six significant proximate determinants of success at application. Significant determinants of the date of UCCA application are also shown, as are determinants of those factors. Determinants of academic achievement are shown in figure 3-6. Conventions are as for figure 3-6. Note that earlier UCCA applications are coded by smaller values, and hence negative influences indicate earlier application. Abbreviations: "N medical app'n"; Number of medical school applications on UCCA form: "Oxbridge app'n"; Oxbridge included on UCCA form: "Mature app't"; Mature applicant: "Date of app'n"; Date of application to UCCA.
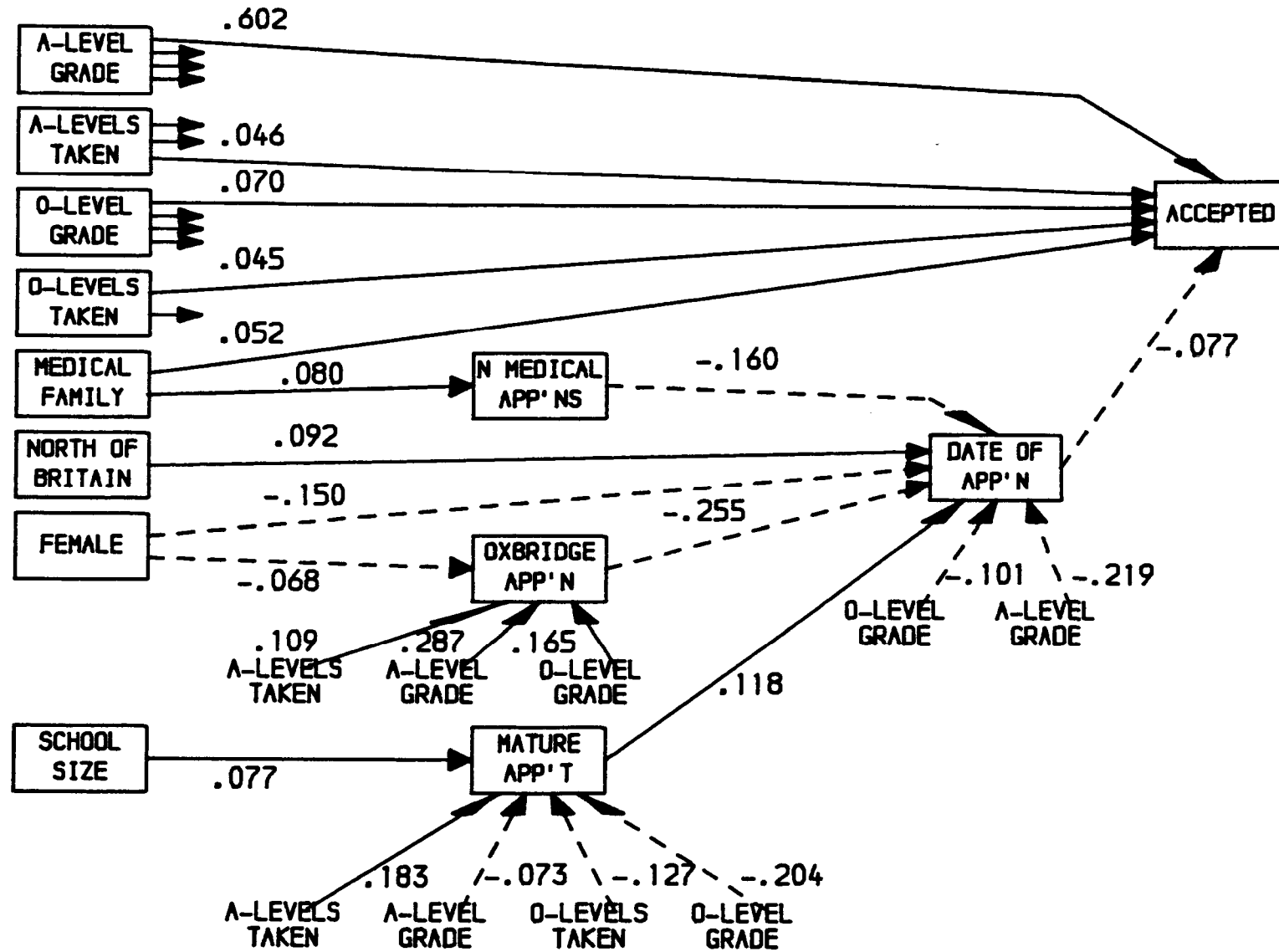
| | O Levels | | | | | | | A-levels | | | | | | |
| | Accept (n=517) | | | Reject (n=844) | | | | Accept (n=517) | | | Reject (n=844) | | | |
	n grade	%	mean	n	%	mean grade	sig diff	n grade	%	mean	n	%	mean grade	sig diff
Physics	469	90.7	4.57	690	81.8	3.91	***	464	89.7	3.72	678	80.3	1.85	***
Chemistry	454	87.8	4.57	671	79.5	3.94	***	502	97.1	4.21	782	92.7	2.30	***
Biology	460	89.0	4.58	667	79.0	4.10	***	353	68.3	4.36	611	72.4	2.70	***
Zoology	0	0	-	2	11.8	3.00	-	23	4.4	4.13	47	5.6	1.98	***
Botany	4	0.8	3.25	5	0.6	3.8	ns	5	1.0	3.80	5	0.6	2.60	ns
Maths	492	95.2	4.55	719	85.2	4.01	***	225	43.5	4.04	299	35.4	2.37	***
Add./Further maths	244	47.2	3.84	267	31.6	3.24	***	16	3.1	2.75	13	1.5	3.15	ns
Applied maths	1	0.2	5.00	3	0.4	2.33	ns	9	1.7	4.00	9	1.1	3.00	ns
English language	487	94.2	4.26	715	84.7	3.73	***	-	-	-	-	-	-	-
English literature	453	87.6	4.14	578	68.5	3.67	***	6	1.2	4.17	14	1.7	2.57	*
Latin	173	33.5	4.35	158	18.7	3.77	***	-	-	-	-	-	-	-
Greek	15	2.9	4.13	11	1.3	2.72	**	-	-	-	-	-	-	-
French	422	81.6	4.03	513	60.8	3.36	***	2	0.4	4.00	5	0.6	2.6	ns
German	120	23.2	3.87	127	15.0	3.53	***	3	0.6	1.66	-	-	-	-
Italian	4	0.8	3.25	6	0.7	3.67	ns	-	-	-	-	-	-	-
Spanish	7	1.4	4.29	11	1.3	3.00	+	-	-	-	1	0.1	5.0	-
Russian	2	0.4	4.00	7	0.8	4.00	ns	-	-	-	-	-	-	-
History	215	41.6	4.23	293	34.7	3.74	***	-	-	-	5	0.6	0.8	-
Geography	236	45.6	4.33	348	41.2	3.80	***	4	0.8	4.75	9	1.1	2.78	+
Economics	9	1.7	4.44	19	2.3	3.37	+	4	0.8	3.25	6	0.7	2.83	us
Economic history	2	0.4	4.00	3	0.4	4.67	ns	-	-	-	2	0.2	4.00	-
Art	67	13.0	3.61	93	11.0	3.35	ns	7	1.4	2.43	9	1.1	2.33	ns
Music	44	8.5	3.75	47	5.6	3.55	ns	1	0.2	4.00	4	0.5	2.00	ns
Religious knowledge	98	19.0	4.01	174	20.6	3.74	+	2	0.4	1.00	1	0.1	4.00	ns
General studies	-	-	-	-	-	-	-	84	16.2	3.77	100	11.8	2.87	***
One or more others	162	31.3	-	321	38.0	-	-	21	4.1		28	3.3	-	-

Table 3-2: shows, for UK nationals only, the numbers who were accepted or rejected for medical school by social class.
Chi-squared=10.41, 4 df, p.0341;
linear trend Chi-squared=7.844, 1df, p=.0051.

	Accepted	Rejected	%accepted
I	244	226	48.1%
II	206	138	40.1%
III	79	47	37.3%
IV	15	5	25.0%
V	10	7	41.2%

Table 3-3: shows, for UK nationals only, the numbers who were
accepted or rejected for St. Mary's, by social class.
Chi-squared= 2.20, 4 df, p=.698;
linear trend Chi-squared=0.007, 1df, NS.

	Accepted	Rejected	%accepted
I	32	438	6.8%
II	27	317	7.8%
III	11	115	8.7%
IV	1	19	5.0%
V	0	17	0.0%

Table 3-4: (Missing text)

(..) each of the 24 variables in predicting success at application to any medical school. The 24 variables are ordered in terms of their significance in the multiple logistic regression. Only the six variables above the dashed line are significant.

Variable	Relative likelihood of acceptance	Multiple logistic Sig.	95% limits	Mean (SD) or percentage in Acceptances	Rejects	Univarii Sig,
				----------	-------	---.
1 Mean A-level grade obtained	8.166x per mean grade	<<.001	6.13 - 11.55	4.04 (.65)	2.32 (1.13)	<.001
2 Mean 0-level grade obtained	2.229x per mean grade	<.005	1.30 - 3.82	4.30 (.46)	3.77 (.56)	<.001
3 Date of UCCA application	1.442x per 28 days earlier	<.01	1.11 - 1.88	45.28 (21.6)	60.68 (25.3)	<.001
4 Number of A-levels taken	1.774x per A-level	<.05	1.05 - 2.99	3.21 (.49)	3.13 (.52)	<.01
5 Number of 0-levels taken	1.168x per 0-level	<.05	1.01 - 1.35	9.3 (2.2)	8.2 (3.2)	<.001
6 From a medical family	1.724x	<.05	1.01 - 2.96	19.9%	15.1%	<.05
7 Overall size of school	1.552x per 100 pupils less	NS	-	834.1 (461.3)	822.6 (357.6)	NS
8 Private sector education	1.405x if public sector	NS	-	51.1%	44.9%	<.05
9 Mature applicant	2.382x if not mature applicant	NS	-	8.3%	19.3%	<.001
10 Oxbridge on UCCA form	1.586x	NS	-	20.3%	3.3%	<.001
11 From north of Britain	1.304x	NS	-	15.6%	13.9%	NS
12 Maths A-level taken	1.292x if not taken	NS	-	43.7%	36.0%	<.01
13 Percentage of 6th form to university	1.039x per 10% increase	NS	-	26.5 (11.8)	25.6 (12.6)	NS
14 Previous UCCA application	1.325x if no prev. app'n.	NS	-	22.6%	20.4%	NS
15 Number of medical schools on the UCCA form	1.303x per medical school	NS		4.97 (.20)	4.94 (.35)	<.05
16 Post A-level application	1.235x	NS	-	39.0%	34.9%	NS
17 Number in 6th form	1.087x per 100 pupils less	NS	-	228.1 (154.4)	221.7 (142.2)	NS
18 Number from 6th form to university each year	1.039x per 10 pupils more	NS	-	57.1 (36.5)	53.9 (34.9)	NS
19 Use of brackets on UCCA form	1.0212 for no bracketing versus all equal first	NS	-	4.20 (1.09)	3.97 (1.30)	<.005
20 Biology A-level taken	1.178x	NS	-	74.4%	81.0%	<.01
21 Female applicant	1.108x	NS	-	40.2%	35.7%	NS
22 Number of London medical schools on UCCA form	1.034x per school	NS	-	3.48 (1.34)	3.78 (1.31)	<.001
23 Total number of choices on UCCA form	1.073x per choice	NS	-	4.96 (.35)	4.98 (.13)	NS
24 Registrar-General's Social class	1.016x per class lower	NS	-	1.66 (.79)	1.80 (.81)	<.005

4: Short-listing for interview.

"Life's business being just the terrible choice"

     Browning, The <u>Ring </u>and the Book, x, 1236.

"So my dear reader take this labour of mine with

a smile, and if you make any progress by me,

nothing will give me more pleasure. If I am

caught blundering (and this is very easy) I will

gladly be corrected ..."

                      William Turner,
            <u>Libellus de re Herbaria </u>(1538).
        cited in the preface to Richards (1977).

<u>Summary.</u>

The process of short-listing medical school applicants for interview is described in the St. Mary's Study. All assessments from the UCCA form were carried out by a single individual, the Dean. Each application was rated on eight separate scales. Factor analysis showed three majorfactors, 'Academic ability', 'Interests', and 'Community service'. All three factors contributed to the interview decision, although Community service was relatively less important. Background factors relating to the three scores are described.

Between September and December 1980 St. Mary's Hospital Medical School received 1478 applications to study medicine in October 1981, an average of about sixteen per day. Nationally during the same period some 49,000 application forms were being processed by medical schools. 1361 of the St. Mary's applicants were included in the survey of Medical Student Selection, and of these 338 (24.8%) were interviewed. Since nearly all of those made offers had been interviewed, it is clear that the process of short-listing is the first hurdle that an applicant must clear. Of course in those schools that do not interview it will be the only hurdle, apart from gaining the requisite A-level grades.

In this chapter the process of short-listing is considered in some detail. Naturally its details wil be expected to vary from school to school, but it is hoped that the experiences of a single school will provide some insight into the process, and give some idea of the type of information available from the UCCA form.

Method

During the winter of 1980 the Dean was the only person in St. Mary's to short-list candidates. This situation is not necessarily felt to be desirable and and at that time he suggested that he was willing for any other member of the Academic Board to assist in the process on the stipulation that in order to preserve comparability that person reads all of the applications without delay; as a result no volunteers were forthcoming. In view of the increasing numbers of applicants for admission in October 1984, responsibility for short-listing has been widened to include several other members of the medical school.

The short-listing was primarily based on the UCCA form itself, which covers three sides of A4 paper and contains information about a range of items: the applicant's social and educational background; other applications to universities, and previous applications; 0- and A-level results to date; a statement by the candidate of his "practical experience; study abroad; occupation and studies after leaving school; interests (intellectual, social and other)"; and a confidential statement by a referee, who also gives information about the applicant's type of school or college, and its size and the number of pupils normally proceeding to university each year. In addition the Dean had any previous UCCA forms which had been submitted to St. Mary's, as well as any correspondence from or about the candidate.

For the purposes of the present study, the Dean completed a proforma on each UCCA form (see appendix 1-3).This consisted of a single sheet of A4 paper on which were a number of rating scales for a set of criteria. Before starting the study the Dean stated what he understood by each of the terms.

"Interests: assessed primarily on their range of interests in this section but used in later questions to provide additional information.

Contribution to school:
(1) as a contributor to non-academic activities.
(2) academic contribution.

Achievement. either or both special achievement in any activity and all-round achievement, including academic work.

Contribution to Community: evidence of practical concern for the welfare of others outside the school community.

Head's confidential report: The Head's assessment of the applicant's ability and suitability for a training and career in medicine in the light of predictable competition, taken at its face value provided the opinion is supported by convincing evidence.

Potential: Dean's assessment of potential based on -
(1) details of Head's report and applicant's statement of interests, noting especially evidence of enterprise, creativity, application,

dedication, stability, staying-power and consideration for others. (2) academic achievement and expected performance taking into account the degree of advantage or disadvantage attributable to home background, type of schooling and continuity (or otherwise) of schooling."

In addition to the above scales, the Dean also rated the 0-levels and A-levels of applicants. Each scale had five values; 'poor', 'indifferent', 'moderately good', 'very good' and 'exceptionally good'. He also noted whether or not a list of items appeared to apply to the candidate being considered. Two of these, courtesy interview and unsolicited information' were explained further in advance of the study:-

"Courtesy interviews: the traditional courtesy of offering an interview to children of graduates or employees of the School has been continued if their record suggests that they would have a chance of an offer, but a courtesy interview entails no preferential treatment in consideration for the offer of a place.

Unsolicited information: information from any source which adds detail helpful in the consideration of an application is considered on its merits. Testimonials that the applicant or applicant's family is well-connected are of no help. 'Nominations' for interview are not accepted."

At the end of the proforma the Dean made an immediate judgement on the likelihood of an applicant being offered an interview, five categories being used, 'definite interview', 'probable interview', 'possible interview', 'probably not interview', and 'definitely not interview'. It should be noted that this assessment does not necessarily indicate whether a candidate was actually interviewed since the proforma was completed at the first reading of the UCCA form, and subsequent re-reading sometimes altered that decision; also some candidates were offered interviews but did not attend, either due to logistic or practical difficulties, or because they had already gained a place elsewhere.

Figure 4-1 shows the frequency with which the Dean used the various categories on the eight rating scales. The majority of distributions are approximately normal, with the exception of the distribution of A-level ratings, which is heavily skewed, the majority of applicants who were applying after taking A-levels having relatively poor grades; most applicants applied before taking A-levels. Although figure 4-1 shows eight separate measurements, this does not mean that eight independent factors can truly be assessed from the UCCA form. To find the true dimensionality of these results a principal component analysis was carried out (using the PA1 option of the SPSS programs Nie et al, 1975), with pair-wise deletion of missing values. Using a scree-slope criterion (Cattell, 1966), it was apparent that there were three underlying dimensions to the judgements (the eight eigen-values being 4.38, 1.09, 0.79, 0.55, 0.42, 0.33, 0.27, 0.15). These three factors together accounted for 78.3% of the total variance. Table 4-1 shows the loadings of the three factors after a Varimax rotation. It is clear that the dimensions can be fairly confidently labelled as Academic Ability, Interest s and Community Service. The three items Achievement, Headmaster's Report, and Potential load significantly on more than one factor, as might be expected from the Dean's prior description of his understanding of the terms.

In order to simplify subsequent analyses, a score was calculated for each candidate on each of the three dimensions, missing values being replaced by population means, and factor score distributions being standardised to a variance of unity.

Table 4-2a shows the Dean's decision on the candidates, the proportion of those in each decision group who were actually interviewed, the final destination of those individuals, and the overall proportion who eventually went to a medical school in October 1981. Almost all 'definite' and most 'probable' individuals were actually interviewed, with hardly any of the remainder being interviewed. Nevertheless a substantial proportion of those in the 'possible' group and below was accepted at other medical schools, there being a clear linear relationship between the overall likelihood of acceptance and the Dean's initial response to the UCCA form.

Table 4-2b shows the number of individuals in various special categories indicated by the Dean, and their eventual destination. Fourteen individuals were given courtesy interviews (that is were granted interviews when they would not have been short-listed on other grounds), although none of them was subsequently accepted by St. Mary's, and their overall success rate was very low. A proportion of candidates had been pre-interviewed' (that is, had asked for an informal discussion with the Dean, and had been granted one because of unusual circumstances in their application) and these candidates in general did better in the selection process; none of them was interviewed at formal interview by a panel inclduing the Dean. Seven candidates had parents who were known personally to the Dean; their overall success rate was high, although not at St. Mary's. No candidates were known personally to the Dean, and neither did he have special connections with any of the schools from which candidates applied in this particular year. The presence of unsolicited information had little effect upon the likelihood of interview or acceptance. A very small group of candidates was perceived as having educational, social or medical disadvantage; taken together their success rate was no different from non-disadvantaged applicants. A

small group of candidates was noted as being 'unusual', generally due to being very young, or having unusual qualifications; they did poorly at St. Mary's, and generally did not do well.

Table 4-4 shows correlations between the Dean's three dimensions and both his own judgements of other features (made at the time of the assessment) and also a number of other background factors, all of which have previously been considered with regard to overall selection bias (see chapter 3). As earlier, only UK nationals have been considered, except in the analysis of nationality itself.

Factor I, Academic ability, shows a correlation with having been pre-interviewed. The Dean's judgement of academic ability correlated strongly with the mean grade at 0-level and the mean grade eventually attained at A-level, and less so with the number of 0-levels taken and the number of A-levels taken. Those taking A-level biology did less well on factor I and those taking A-level maths did better, as did Oxbridge applicants, and female applicants. Applicants putting a large number of London schools, using a lot of bracketing on their UCCA form, or who had applied previously or late to UCCA, or who were mature, did less well or factor I. Those who put fewer choices on their UCCA form were rated more highly, but this was due to a small number of individuals who were re-applying and had only put St. Mary's and Oxbridge on their UCCA form.

Factor II, Interests, was correlated with having been pre-interviewed. There was a significant correlation with all of the measures of educational qualification (EQ), with a relatively greater emphasis on the number of subjects rather than on the grades obtained, as compared with Factor I. Applicants of lower social class did less well on this factor, as did mature applicants, those who had used a lot of bracketing on their UCCA form, those who were post-A-level at the time of

application, those who had previously applied to UCCA, and those who applied relatively late to UCCA. Applicants from private sector schools, or those also applying to Oxbridge scored rather higher on this factor. Non-UK nationals showed low ratings on this factor.

Factor III, Community Service, showed a significant correlation with unsolicited information and a marginally significant correlation with educational disadvantage. There were also correlations with HQ, but these were less than for other factors. Female applicants were particularly likely to score highly on Factor III, as were those from large sixth forms, and those who had put a larger number of medical schools on their UCCA form. Late applicants, post-A-level applicants, mature applicants, those who used a lot of bracketing on their UCCA form, non-UK nationals and those from a medical family performed poorly on this factor.

However, as in chapter 3, it must be stressed that a problem in the interpretation of such results is that many background items are necessarily inter-correlated, and thus not statistically independent. As a result a stepwise hierarchical multiple regression has been used to predict each of the factor scores from the background variables, at each step a variable being added whose effect was independent of those prior to it in the analysis, and which was the best predictor amongst those still remaining to be entered. Table 4-3 shows the results of such an analysis.

Eleven items predict Factor I, Academic ability (multiple r = .734). The most important are mean 0- and A-level grades, and it can be seen that once these are taken into account that numbers of 0- and A-levels are of minimal importance. Oxbridge applicants, early UCCA applicants, and those with unsolicited information score more highly on this factor,

as also do those who have made more choices on their UCCA form. Female applicants, those who have applied previously to UCCA, and those who have had a private sector education do less well. In order to avoid an apparent contradiction with an earlier statement it must be emphasised that whilst women overall have higher scores on this factor than men, they nevertheless have lower scores than would be predicted from 0 and A level results and the other six factors above them in the analysis of Table 4-4.

Eight separate items predict Factor II, Interests (multiple r = .383). 0-level achievement predicts this factor well, with A-level achievement making a lesser contribution. Oxbridge applicants, those of higher social class, those who were pre-interviewed, and those applying early to UCCA tend to do well on this factor, whereas those who have applied to UCCA previously tend to do less well.

Seven separate items predict Factor III (Community Service) (multiple r =.419). The most important item is that female applicants score much higher, as also do early applicants to UCCA, those who have come from larger sixth forms, those who have applied to Oxbridge, or to a greater number of medical schools, or those who have educational disadvantage. Educational qualifications are of minimal importance, with the exception that those with higher 0-level grades do better on this factor.

Thus far it is clear that the Dean is making three independent judgements on each UCCA form, and those judgements each have a different pattern of correlations with background factors. One may now ask how these three judgements are used in deciding who should be interviewed, and whether, after taking those judgements into account, there remains any independent effect of the other background variables in determining

Selection for interview.

Table 4-5 shows the results of a two-stage hierarchical multiple regression designed to answer those questions. In Stage I the three judgements were entered; in Stage II the background variables were added in as well. Stage I shows clearly that Interests and Academic Ability are of almost equal importance in determining the interview decision, with Community Service having a lesser but nevertheless highly significant independent prediction of interview decision. Together these three items produce a multiple correlation of .796 with the interview decision. Addition of a further 30 background variables in Stage II produces a highly significant increase in the prediction of the interview decision (F(30,1022 = 4.57, p<0.001).

Table 4-5 shows the nine particular variables which were individually significant in the hierarchical analysis, in addition to the three judgements made by the Dean. These nine variables raised the multiple correlation from .796 to .818 (thereby accounting for 9.7% of the remaining variance). The most important variable is mean 0-level grade which shows a negative correlation with interview decision; the implication seems to be that individuals with lower 0-level grades are slightly better at obtaining interviews than would have been predicted from the three judgement variables. Similarly, early UCCA applicants are more likely to be interviewed than would be predicted on the basis of the three judgements. Those with higher number of A-levels, with more choices on their UCCA form, with courtesy interviews or educational disadvantage are also more likely to be interviewed than would be predicted on the basis of the three judgements. Female applicants and those with medical problems or from private sector education are slightly less likely to be interviewed than would be predicted from the three

judgements alone.

Differences between applicants to and acceptances by medical school groups have been examined, for a number of background variables. One may also carry out a similar process for the Dean's judgements of the candidates making the assumption that Admissions Tutors elsewhere will probably make broadly similar judgements from an UCCA form to those made at St. Mary's. One therefore looks for evidence of <u>differential application, systematic selection, differential selection, and differential acceptance,</u> in an identical manner to that described in chapter 3 (Figure 4-2).

For Academic Ability there is highly significant evidence of differential application ($p < 0.001$) (that is differences between applicants to different schools), an effect mainly due to the higher standard of Oxbridge applicants, but with significant evidence ($p < 0.001$) for differences between the non-Oxbridge schools. There was significant evidence of systematic selection ($p < 0.001$) (that is, taken overall those selected had higher scores on the Dean's rating of Academic ability than did those who were rejected) and of differential selection ($p < 0.001$) (i.e. the difference between acceptances and rejections differed between different schools), due mainly to the relatively higher standard of Oxbridge entrants over applicants, but with some evidence ($p < 0.05$) for St. Mary's entrants also having relatively higher scores. The highly significant differential acceptance ($p < 0.001$) (i.e. entrants to different schools differed on the Academic Ability scale), was mainly attributable to the higher standards of Oxbridge entrants, but also due to significant differences between non-Oxbridge schools ($p < 0.05$).

Interests showed evidence of differential application (p<0.001), which is entirely attributable to the better performance of Oxbridge applicants. Systematic selection (p<0.001) and differential selection (p<0.001), was a result of the greater difference between applicants and entrants at St. Mary's. Differential acceptance (p<0.001), was mainly due to Oxbridge entrants scoring more highly, but also to significant differences between non-Oxbridge schools (p<0.001).

Community Service showed significant differences between schools (p<0.001), mainly due to the higher scores of applicants to English and Welsh medical schools. There was significant evidence for systematic selection (p<0.001), but no evidence for differential selection or differential acceptance.

An interesting question concerns the degree to which the judgements of the Dean relate to the self-described attitudes and interests of the applicants. Table 4-6 shows for 329 interviewees the correlations between the Dean's assessments and the students' scores on the eight ethical attitudes (and their two super-ordinate attitudes), which will be described in greater detail in chapter 8, and are summarised at the beginning of chapter 9. Four of the correlations are significant, although only two reach the 0.01 level, those between the Dean's rating of Community Service, and the scores on attitudes 2:Social tough-mindedness and II:Tough-mindedness. The slightly worrying implication of such results is that some applicants might project high images of community service on their UCCA forms because they are sufficiently versed in the realpolitik of applications to realise that it is necessary in order to do well. Table 4-7 shows correlations between the Dean's judgements and the five measures of culture, and their super-ordinate factor (see chapter 10 for a detailed description of the

derivation of these scales, and the beginning of chapter 11 for a brief summary of them). Only two correlations are significant at the 0.01 level; those applicants with high ratings on the Dean's Interests scale have low 'travel' scores (or this might be more easily interpreted as saying that those with high travel scores have low Interest ratings, perhaps through being perceived as having <u>only</u> their travel to talk about on the UCCA form); and high ratings on the 'popular culture' scale correlate with the Dean's rating of Community Service (the relationship perhaps being mediated through social groups such as Rotary clubs, Scouts, Guides, etc., which provide both social life and community activity).

<u>Discussion.</u>

The results reported in this chapter are, in essence, a detailed investigation of the psychology of one man's response to the difficult problem of dividing a large number of complex application forms into two groups, those with special claim to interview and those without, and of his strengths and weaknesses when confronted with the task. Two immediate problems of interpretation arise: are the judgements veridical (i.e. do assessments of, say, 'Community Service' truly relate to the candidate's actual community service); and are the judgements typical (i.e. are they similar to those made by the hundred or so other people who are reading similar forms in other schools and colleges)?

Verification of the validity of judgements is not easy. Nevertheless it should be noted that the judgement of Academic Ability relates closely to mean 0-level grade and, particularly, to mean A-level grade (despite the fact that the majority of applicants had not taken A-levels at the time of application), and that the correlations of

Academic Ability with background factors are very similar to those found between Educational Qualifications and the same background factors. However the results of tables 4-6 and 4-7 suggests that it is possible that the judgements which can be derived from an UCCA form may well not correspond to the dimensions which describe the broader personality of the applicant.

Whether the Dean's judgements are typical of those made by others assessing similar forms is almost impossible to say but it is clear (table 4-2a) that his judgement of priority for interview accurately predicted the chance of acceptance by a medical school. The present study clearly demonstrates that at least three independent judgements can be made in the basis of an UCCA form. It is possible that an experienced judge could derive more information; if so, then the present assessor is atypical. This however does not seem to be a likely possibility, either on educational grounds (the information on the form is relatively limited) or on psychological grounds (in view of a number of studies which show that the measurement of meaning usually results in three independent dimensions (Osgood et al, 1957). Alternatively it could be that the present judge is making a more complex judgement than some other assessors, who might be using two or even just one dimension (e.g. 'Good-Bad' or 'Bright-Dull'). The possibility must also be considered that the very task of making explicit detailed judgements on a number of scales has itself increased the dimensionality of the judgements in the present case because of the necessity of increased introspection. Nevertheless, even if the latter has occurred, the present study does allow us to set a lower limit to the dimensionality of the information which is in principle available from the UCCA form.

Given that these judgements can be made, then this study shows how the judgements may be combined to give an overall judgement weighted towards Academic Ability and Interests, but which also has a substantial component from Community Service (the lesser weighting of the latter perhaps reflecting both that it is the one for which least information is available on the UCCA form, and the one for which there is the least objective confirmation of claims). Whilst the majority of the interview decision is made on the basis of the three judgements, it is also of interest that some other factors also enter into the decision (table 4-5); in particular it is clear that courtesy interviews are given (but confer no advantage) in some situations in which an interview would not normally be predicted, as also are some interviews given to candidates with perceived educational disadvantage, or with relatively low 0-level grades who might not otherwise have expected them. There is also some evidence that female applicants are not given full credit for their achievements as described on the UCCA form. Of particular interest is the date of UCCA application, a factor of importance in determining overall selection (see chapters 2 and 3); not only do early applicants score more highly on each of the three factors but they are then even more likely to obtain interviews than would be predicted from their scores on the three judgements.

In conclusion the three judgemental dimensions used by a Dean in his assessment of UCCA forms, have been demonstrated, and it has been shown how these judgements are combined to produce a short-list of candidates for interview, and how other factors are also of some importance in determining the membership of that short-list.

Figure 4-1: Shows the distribution of judgements made by the Dean on each of the eight scales. The sample size is between 1328 and 1352 for all distributions except 'A-levels' for which it is 405. The abscissa values of -1, 0, 1, 2 and 3 correspond to judgements of 'Poor', 'Indifferent', 'Moderately Good', 'Very Good', and 'Exceptionally Good'.
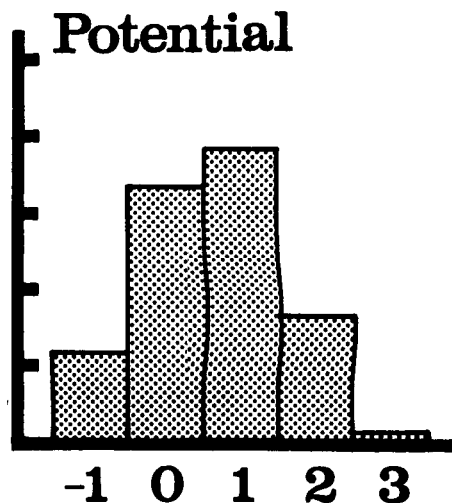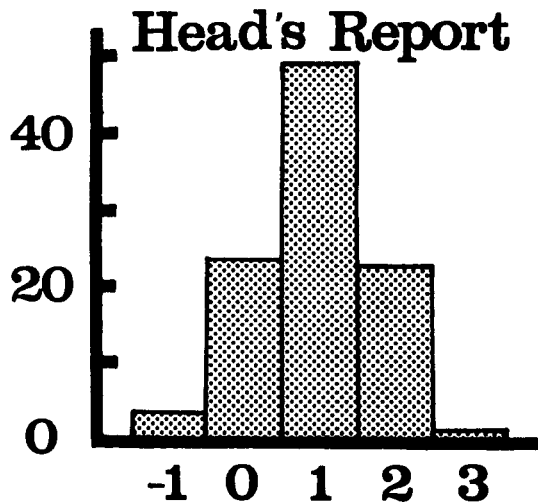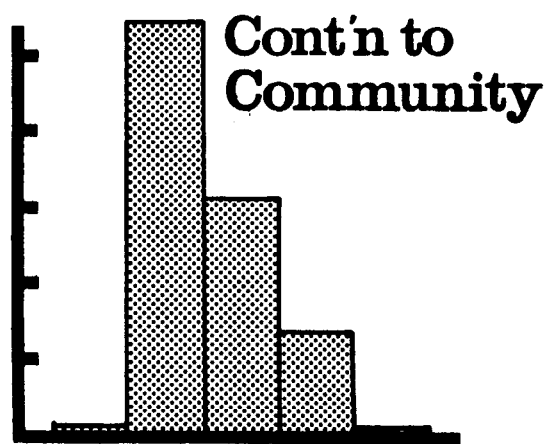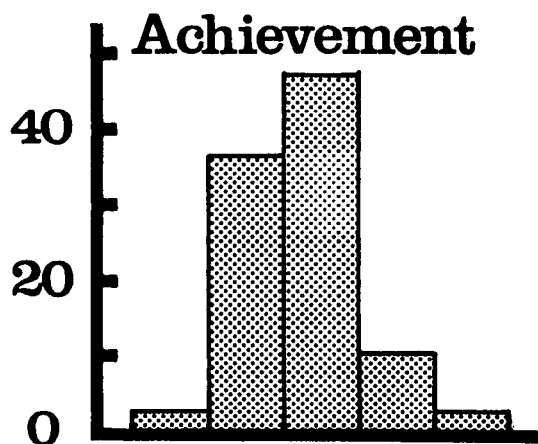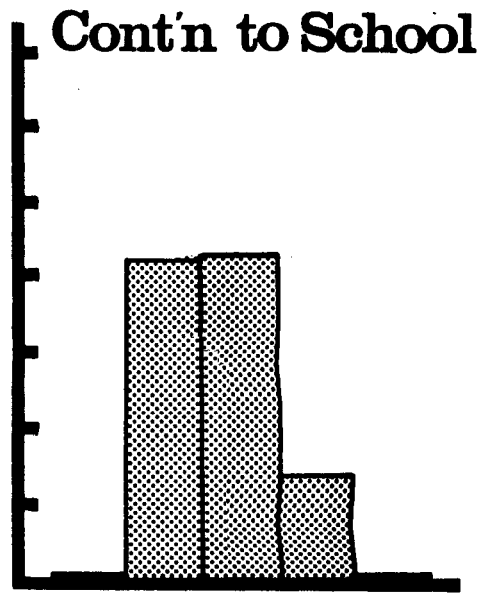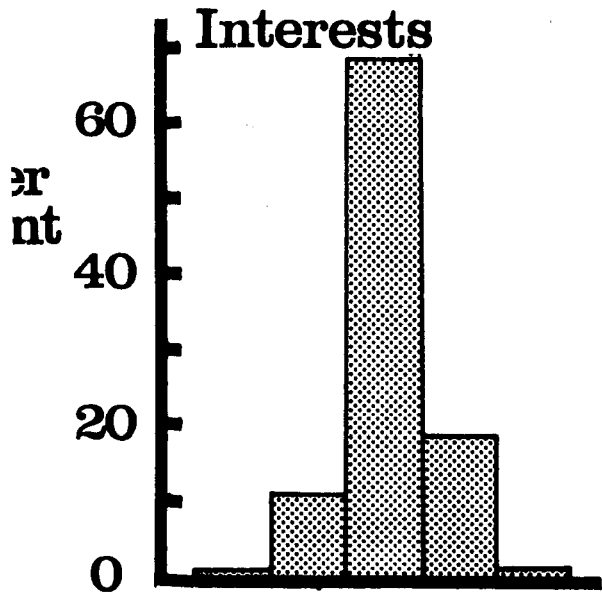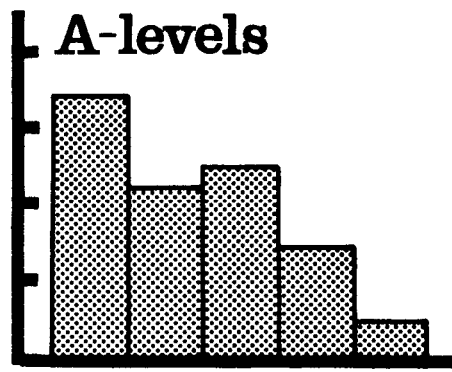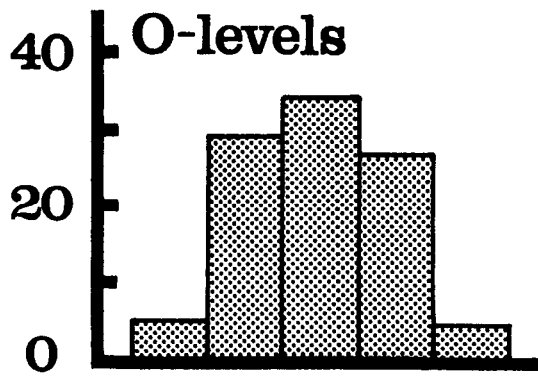
Figure 4-2: Shows the mean grades on the Dean's three judgement scales of applicants (open triangles) and acceptances (solid triangles) to five medical school groups (OC: Oxford and Cambridge; SM: St. Mary's; L: Other London medical schools; EW: Other England and Wales medical schools; SNI: Scottish and Northern Ireland medical schools).

'Academic Ability'

'Interests'

'Contribution to Community'

OC SM L EW SNI
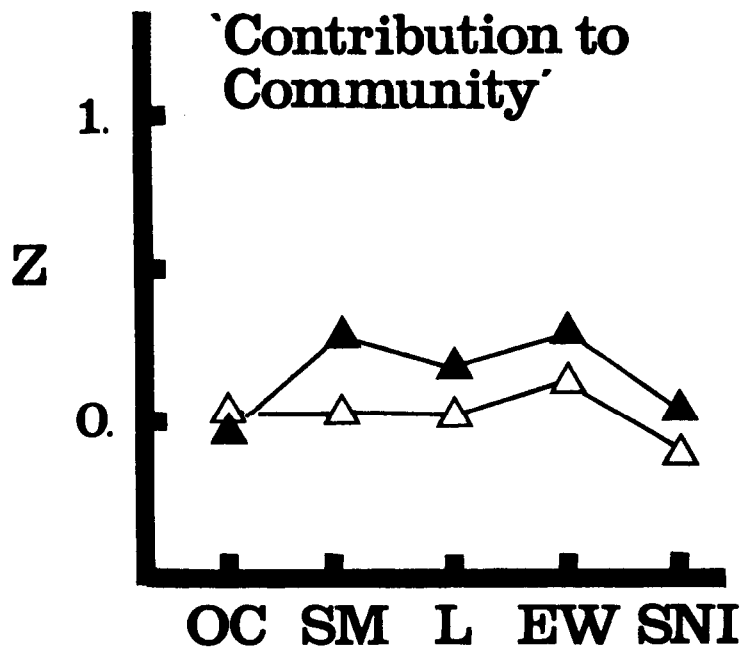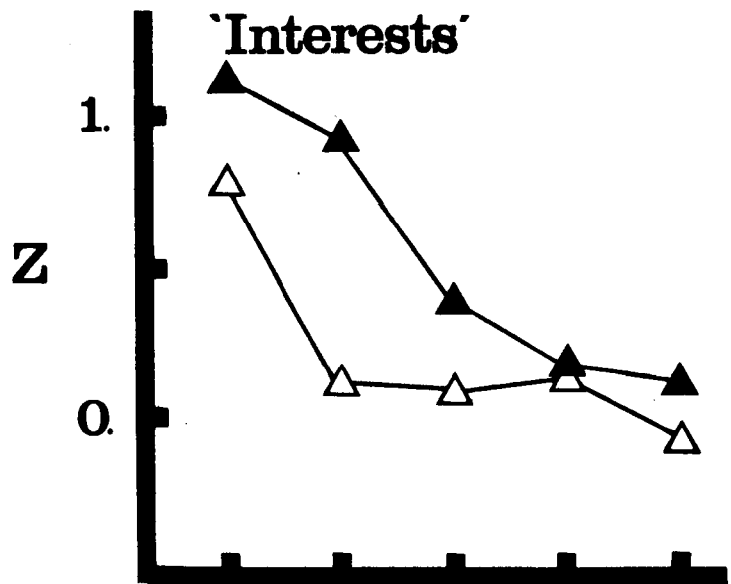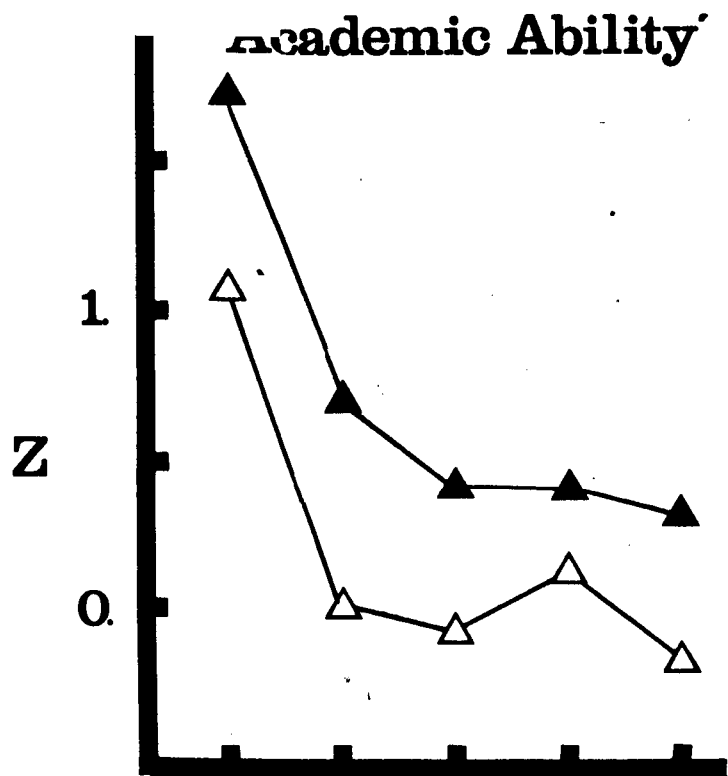
Table 4-1: Shows the loadings of the eight judgements made by the Dean on each of the three Varimax rotated factors. Loadings greater than 0.25 have been emphasised.

	Varimax factors		
	I	II	III
	"Academic ability"	"Interests"	"Community service"
O-levels	.784	.193	.112
A-levels	.902	.062	.009
Interests	.216	.845	.132
Contribution to school	.216	.845	.132
Achievement	.716	.472	-.019
Contribution to commnunity	.087	.164	.958
Headmaster's report	.573	.481	.322
Potential	.712	.482	.284
Common variance	45.9%	35.8%	18.3%

Table 4-2: shows the numbers in various groups, and their destinations.

| | | | | Destination group | | | | | Overall acceptances |
Group	N	Actually interviewed	Oxbridge	St. Mary's	Other London	Non-London	Non-medical	Not accepted	for medicine
Total	1361	24.8%	3.1%	6.8%	17.4%	10.8%	12.74	49.2%	38.0%

a). Dean's overall decision.

Group	N	Actually interviewed	Oxbridge	St. Mary's	Other London	Non-London	Non-medical	Not accepted	Overall acceptances for medicine
Definite interview	150	98.0%	13.3%	29.3%	23.3%	15.3%	1.3%	17.3%	80.7%
Probable interview	215	76.3%	26.3%	16.7%	26.5%	12.6%	12.6%	27.0%	60.0%
Possible interview	193	4.1%	10.5%	2.6%	26.4%	20.2%	10.4%	38.3%	51.3%
Probably not interview	68	2.9%	0.0%	1.5%	29.4%	8.8%	11.8%	48.5%	39.76
Definitely not interview	694	0.6%	0.6%	0.1%	10.1%	6.8%	16.3%	66.1%	17.6%

b). Other factors

Group	N	Actually interviewed	Oxbridge	St. Mary's	Other London	Non-London	Non-medical	Not accepted	Overall acceptances for medicine
Courtesy interview	14	100.0%	7.1%	0%	7.1%	0%	7.1%	78.6%	14.3%
Pre-interviewed	14	100.0%	35.74	28.6%	7.1%	0%	21.4%	7.1%	71.4%
Parents known personally	7	71.4%	0%	14.3%	57.1%	14.3%	0%	14.3%	85.7%
Unsolicited information	24	41.7%	4.2%	8.3%	33.3%	4.2%	12.5%	37.5%	50.0%
Educational disadvantage	7	57.1'%	0%	28.6%	0%	0%	14.3%	57.1%	28.6%
Social/Domestic disadvantage	4	50.0%	0%	25.0%	25.0%	0%	25.0%	25.0%	50.0%
Medical problem	3	0%	0%	0%	33.3%	33.3%	0%	33.3%	66.7%
'Unusual'	11	9.1%	0%	0%	18.2%	9.1%	27.3%	45.9%	27.7%

Table 4-3. Correlations between the Dean's three orthogonal factors and other variables. UK nationals only, with the exception of the item for Non-UK applicant itself. For binary variables a positive correlation means that the sub-group indicated scored more highly on the scale. NS=Not Significant; + = $p<0.1$; * = $p<0.05$; ** = $p<0.01$; *** = $p<0.001$

	I Academic ability	II Interests	III Community Service
Dean's comments:			
Courtesy Interview	.005NS	.008NS	.005NS
Candidate pre-interviewed	.087**	.106***	.029NS
Parents known personally	.049+	.045NS	.033NS
Unsolicited information	.041NS	.015NS	.061*
Educational disadvantage	-.041NS	.007NS	.047+
Social/Domestic disadvantage	.030NS	.011NS	.011NS
Medical Problem	.029NS	-.020NS	-.040NS
'Demographic variables':			
Non-UK applicant	-.036NS	-.267***	-.102***
Female applicant	.059*	.023NS	.313***
Social class	-.049NS	-.163***	-.032NS
Medical family	-.039NS	.021NS	-.051+
Mature applicant	-.174***	-.136***	-.100***
From north of Britain	.068*	.040NS	-.029NS
Schooling:			
Private sector education	.026NS	.086**	-.029NS
Total school size	.039NS	.009NS	.037NS
Sixth form size	.004NS	-.029NS	.091**
Number to university each year	.007NS	.018NS	.029NS
Educational qualifications:			
Number of 0-levels obtained	.172***	.165***	.072***
Mean 0-level grade obtained	.655***	.250***	.166***
Number of A-levels obtained	.080**	.080**	.002NS
A-level grade obtained	.597***	.213***	.115***
A-level biology taken	-.149***	-.026NS	.006NS
A-level maths taken	.156***	.030NS	.025NS
UCCA form:			
Oxbridge application	.348***	.228***	.008NS
Number of London applications	-.186***	-.046NS	.026NS
Amount of bracketing on form	-.126***	-.097***	.059*
Post-A-level applicant	-.011NS	-.081**	.059*
Previous UCCA application	-.059*	-.103***	.024NS
Date of UCCA application	-.319***	-.223***	.272***
Number of choices on UCCA form	-.138***	-.020NS	.028NS
Number of medical schools on UCCA form	-.001NS	.027NS	.100***

Table 4-4: Shows hierarchical multiple regressions of the Dean's three orthogonal factors. UK nationals only. Descriptions of variables have been modified so that all beta coefficients are positive.

Order	Variable	Beta	p
Dependent variable = Factor I (Academic ability)			
1	Higher mean 0-level grade obtained	.431	<.001
2	Higher mean A-level grade obtained	.271	<.001
3	Oxbridge application on UCCA form	.112	<.001
4	Early date of UCCA application	.077	.001
5	Larger number of choices on UCCA form	.085	<.001
6	Biology A-level not taken	.051	.015
7	No previous UCCA application	.057	.009
8	Unsolicited information	.054	.011
9	Male applicant	.048	.028
10	Higher number of 0-levels obtained	.054	.016
11	Public sector education	.043	.049
Dependent variable= Factor II (Interests)			
1	Higher mean 0-level grade obtained	.144	<.001
2	Oxbridge application on UCCA form	.111	<.001
3	Higher social class	.121	<.001
4	Early date of UCCA application	.114	<.001
5	Higher number of 0-levels obtained	.083	.002
6	No previous UCCA application	.091	.019
7	Candidate pre-interviewed	.084	.004
8	Higher number of A-levels obtained	.062	.032
Dependent variable = Factor III (Community Service)			
1	Female applicant	.268	<.001
2	Early date of UCCA application	.227	<.001
3	Larger size of school sixth form	.088	.001
4	Oxbridge application on UCCA form	.084	.015
5	Higher mean 0-level grade obtained	.079	.024
6	Educational disadvantage	.067	.017
7	Higher number of medical schools on UCCA form	.055	.053

Table 4-5: Hierarchical multiple regression of Dean's interview
judgment on the Dean's orthogonal factors (Stage I) and on other
variables (Stage II). UK nationals only. Variable descriptions
have been modified so that all beta values are positive.

Order	Variable	Beta	p
Stage I:			
1	Higher score on factor II (Interests)	.534	<.001
2	Higher score on factor I (Academic ability)	.545	<.001
3	Higher score on factor III (Community Service)	.252	<.001
Stage II:			
4	Lower mean 0-level grade obtained	.100	<.001
5	Courtesy interview	.071	<.001
6	Educational disadvantage	.069	<.001
7	Early date of UCCA application	.078	<.001
8	Higher number of A-levels obtained	.061	.001
9	Smaller number of choices on UCCA form	.064	<.001
10	Male applicant	.043	.005
11	No medical problem	.045	.012
12	Public sector education	.045	.013

Table 4-6: Correlations of Dean's judgements with ethical attitudes of applicants. (N=329).

		Dean's judgements.		
		I Academic ability	II Interests	III Contribution to community
Ethical attitude Factor:				
1	"Vital libertarianism"	.002	-.055	-.095 +
2	"Social tough-mindedness"	.086	-.063	.161 **
3	"Liberalism"	.042	.004	-.010
4	"Personal libertarianism"	-.082	.034	.082
5	"Economic conservatism"	.112 *	-.101 +	.120 *
6	"Medical control"	.014	.003	-.047
7	"Sex education"	.037	-.055	-.086
8	"General Practise"	.110 *	-.020	-.003
I	"Libertarianism"	-.010	-.084	-.042
II	"Tough-mindedness"	.097 +	-.090	.165 **

Table 4-7: Correlations of Dean's judgements with culture scores of applicants. (N=332).
+: p<0.10; *: p<0.05; **:p<0.01; ***:p<0.001.

| | Dean's judgements. | | |
	I Academic ability	II Interests	III Contribution to community
Culture Factor:			
1: Literary culture	-.059	-.038	-.004
2: Low-brow culture	-.061	.109 *	.049
3: Travel	.060	-.162 **	.021
4: Popular culture	-.033	.047	.170 **
5: Non-literary culture	.087	-.054	-.083
C: 'Culture'	-.024	-.041	.002

5: Interviewing.

"God, this is awful. Hesitating for two hours up and down a filthy street, lips and hands and knees tremulously out of control, my heart pounding in fear of the little door through which I must go ..."

352087 A/c Ross (T.E. Lawrence), The Mint.

"Before the war it was usual for candidates to be interviewed by the dean or his representative. The interviews were generally perfunctory, but served to exclude those whose unsuitability was conspicuous"

Harris (1948; p.317).

<u>Summary.</u>

The process of interviewing candidates for admission to medical school is analysed in the St. Mary's study. Two interviewers and a chairman independently assessed each interviewee on a series of six scales. Interviewers showed high correlations between one another on their judgements, although there was evidence that judgements were influenced by the particular chairman of the panel. Factor analysis of the judgements revealed three independent factors ('Academic suitability', 'Non-academic suitability', and 'Health'). Non-academic suitability was the major determinant of interview success, with the role of academic suitability depending in part on the chairman of the panel. Judgements showed moderate correlations with those made by the Dean from the UCCA form alone. Background determinants of the interviewers' factors are described; non-academic suitability was related to personality (high extraversion and low psychoticism) and to the choices made on the UCCA form. Analysis of applicants subsequently admitted to non-interviewing rather than interviewing provincial medical schools in England and Wales, suggested that they were lower on 'Interests' and higher on 'Academic ability'.

The interview is an important part of the selection of medical students in most medical schools in Britain, and in the United States (Puryear and Lewis, 1981). Three hundred and thirty eight (24.8%) of 1361 applicants to St. Mary's Hospital Medical School who took part in the survey of Medical Student Selection were interviewed; the process of short-listing for interview has been described previously in chapter 4. If similar proportions can be applied to other medical schools, then a total of about 8,500 medical school selection interviews take place each year in Britain.

The interview as a method of selection has been much criticised; for example Simpson described it as "potentially even less reliable than random selection [and yet' it] is regarded as a sort of clinical examination of the soul" (Simpson, 1972; p.32). The Royal Commission on Medical Education of 1968 suggested that "interviews may not always be necessary if full school reports are available" (Royal Commission, 1968). In 1980-81, 10 out of the 31 British medical schools interviewed only a minority of entrants (Richards, 1983).

Interviewing itself has been criticised both by psychologists (e.g. Wagner, 1949; Mayfield, 1964; Ulrich and Trumbo, 1965; Schmitt, 1976; Arvey and Campion, 1982) and sociologists (Kelsall, 1963) on the grounds that the assessments are not reliable, predictive or objective, and that the conviction they they are useful is often held with an unusual degree of dogmatism and certainty (e.g. Harris, 1948, p.318; "there can be little doubt that it is sometimes not only reliable but amazingly sensitive"). Interviews can undoubtedly be influenced by extraneous factors; for instance Kopelman (1975) in a study at the Middlesex Hospital Medical School showed that interviewers' perceptions of candidates were influenced by the quality of the preceeding candidates

("the contrast effect"). Interviews also fail to predict final degree class very well, at least in psychology students (Weir, 1976), and Schofield and Farrard (1975) found no difference in performance of medical students admitted after interview, or admitted solely on the basis of exam results. Finally, it is not even clear that <u>applicants</u> find interviews useful in helping them to choose betwen universities, Newman <u>et al</u> (1977) finding that interviewed psychology applicants were no more likely to accept conditional offers from that department than were non-interviewed applicants.

In this chapter interviewing is examined to see how it was carried out in one medical school, to describe the reliability of the assessments, and to examine those factors which might bias the process.

<u>Interview procedure.</u>

Four interview sessions were held each week from mid-October to December with a few more early in the New Year. Interviews lasted about 15 minutes and were conducted by a chairman and two interviewers, the latter usually but not always consisted of one pre-clinical and one clinical member of staff. The role of the four chairmen (the Dean, who is a Professor of Medicine, the Deputy Dean, who is Professor of Anatomy, the Senior Pre-clinical Tutor, who is Reader in Chemical Pathology, and the past Senior Pre-Clinical Tutor, who is Professor of Biophysics) was to give the interviewing board an idea of the overall standard of the day's interviewees relative to previous weeks. On some occasions a member of the Council of the Medical School attended as an observer out of interest; several members took this opportunity.

The interviewers were selected according to their availability from a panel of 32 members of staff, approximately one-quarter of whose members change each year, and who are drawn from both clinical and non-clinical departments. Over a period of several years most members of academic staff of lecturer grade or above and most of the part-time teachers, have the opportunity to participate in interviews.

Morning interviews are followed at 1 pm by a tour of the School conducted by students, and afternoon interviews are preceded by the tour. This informal tour and opportunity to meet and question students is an important opportunity for applicants to make a more informed choice of medical school.

Interviews are as informal as possible. The opportunity is taken to enlarge on details in the UCCA application form and particularly to see whether the applicants have thought for themselves about their intended career, and can reason in discussion; they are also invited to ask questions about the course and the School itself. The structure of the interview consists of a brief introduction by the Chairman, followed by two five-minute sessions of questions from the two interviewers, followed by one or two questions by the Chairman and the opportunity for the candidate to ask questions.

Method.

Before discussing the candidate amongst themselves, the chairman and interviewers completed a simple pro-forma which asked them to rate the candidate on each of five scales, and to make a recommendation in one of four categories, A: definitely accept; B1: take if possible; B2: waiting list; and C: reject (appendix 1-4). Having made their

individual recommendations the board members then discussed with the chairman their joint recommendation. In the rare event that agreement was not reached the decision was left to the Dean in consultation with the chairman of the board. Each chairman routinely met with the Dean within a short time of the interviews to review the applications and to elaborate on recommendations.

The scales on the pro-forma are not regarded as optimal, and in a repeated study would certainly be improved; nevertheless they are adequate for answering a number of interesting questions. No explicit attempt was made to explain to individual interviewers what the items on the proforma meant, and it is possible although unlikely that some have misunderstood the terms used; nevertheless the majority had no difficulty in completing the form on each candidate.

As described in chapter 2, interviewees completed a second series of questionnaires (Q2), in addition to those completed by all applicants. (Q1). Q2 contained a large number of questions on interests, cultural pursuits, moral, ethical and political attitudes, the Eysenck Personality Questionnaire (EPQ; Eysenck and Eysenck, 1975), and the State-Trait Anxiety Inventory (STAI; Spielberger et al, 1970). Half the interviewees completed Q2 before their interview and the other half after their interview.

Results.

Figure 5-1 shows the frequency with which the Chairmen and the two interviewers used the items on the rating scales. The health of candidates was almost invariably regarded as adequate. Academic ability was regarded as adequate in most instances, although of course the

interviewees are themselves highly selected on the basis of academic ability, as a result of the shortlisting process. Personality was generally regarded as suitable in the vast majority of cases. The potential contribution of the candidates to the medical school was more broadly distributed, as was the assessment of the candidates' 'Potential' (in its broadest sense). Recommendations covered all categories, with a majority in favour of A or Bl.

Table 5-1 and figure 5-1 summarise the results of comparisons of the judgements of chairmen and interviewers; chairmen made significantly lower estimates of 'potential contribution' and 'potential', but otherwise there were no significant differences.

Agreement between interviewers was assessed by means of Goodman and Kruskal's gamma statistic (Everitt, 1977). Table 5-2 shows that there is a significant agreement for all scales, and that there was a tendency for the two interviewers to agree more closely than did either interviewer with the chairman. Table 5-3 shows the agreement between the detailed recommendations of the interviewers; the recommendations differ by more than one step in 6.7%, 7.2% and 6.2% of the cases in the three tables.

Although the interviewers each made their judgements independently of one another it is possible that a board of interviewers might develop its own 'personality', which would affect the manner in which the interviewers used their rating scales. If this were the case then it would seem most likely that the personality of the chairman, normally being the most experienced member present, would stamp itself most firmly on the committee as a whole. Figure 5-2 shows that the recommendations of the chairmen do indeed differ significantly (Chi-squared for linear trend = 29.3, 3 df, p <0.001). Of greater interest however is that the interviewers' recommendations also differ, according to who is the

chairman of the board (Chi-square for linear trend = 8.8, 3 df, p<0.05 and 6.9, 3df, p<0.10 for interviewers 1 and 2 respectively). and the differences are maintained in the final recommendation of the whole board (Chi-squared for linear trend = 20.4, 3df, p<0.001). It is important to note that these differences are not due to differences between the interviewees, a series of one-way analyses of variance failing to demonstrate any significant differences between interviewees according to the particular chairman of the interviewing board.

Table 5-4 shows the eventual destination of the interviewees as a function of the board's recommendation. Those given A or Bl recommendations fared better overall than did those with B2 or C recommendations; nevertheless some 44.6% of those given B2 or C grades by the interviewers were eventually accepted at some other medical school. Same of those rejected were, however, rejected because they already had offers from elsewhere and St. Mary's had few places left; many were put on the waiting list rather than receiving an offer for the latter reason. At the time of their St. Mary's interview, 15.1% of interviewees had already been interviewed by another medical school, 32.4% had an interview arranged at another medical school, 0.2% had unconditional and 9.0% had conditional offers at other medical schools, and 4.5% had already been rejected by at least one other medical school.

Given that interviewers can make an individual recommendation about an interviewee which correlates closely with that of the other members of the committee, one may ask what factors are used in coming to that decision. Table 5-5 shows the results of a principal components analysis, followed by Varimax rotation, of the averaged judgements of the three interviewers on each of the six scales, to investigate the factors used by interviewers in making their judgements. The eigen-values of

3.33, 0.97, 0.77, 0.48, 0.28 and 0.16 suggest that there are three separate factors, and these are readily identified in Table 5-5 as 'Academic Suitability', 'Non-academic suitability' and 'Health'. Of particular interest is that the overall recommendation after interview is more closely related to 'Non-academic suitability' than to 'Academic suitability'. However in exactly the same manner as the Chairman can influence the overall distribution of the recommendations, so there is evidence that he can influence the manner in which the recommendation is arrived at. Separate factor analyses analogous to that of Table 5-5 but separately for the interviews chaired by each of the chairman suggest that the emphasis put upon academic ability depends in part on the chairman, despite the three factors being derived in almost identical fashion in each case; the loadings of Recommendation on 'Academic suitability' were 0.221, 0.412, 0.565 and 0.627 for chairman B, A, D and C respectively.

There is also evidence that different interviewers used academic suitability to different degrees in making their recommendations; the loading of academic suitability on the interviewers' individual recommendations was 0.471 for those from pre-clinical departments, 0.300 for those from laboratory-based clinical departments (haematology, immunology, etc.), and 0.288 for those from clinical departments. Overall, medically qualified interviewers put less weight on academic factors (loading = 0.337) than did non-medically qualified interviewers (loading = 0.426). It must, however, be remembered that practically all applicants short-listed for interview were academically strong.

Since the Dean when short-listing on the basis of the UCCA form (Chapter 4), and the interviewers are each making judgements about a candidate, one may ask how these judgements are related. Table 5-6 shows

that there are clear associations between the interviewers' and the Dean's assessment of academic ability, and between the Dean's assessment of 'Interests' and the interviewers' assessment of 'Non-academic suitability'. However the Dean's assessment of Community Service seems to be independent of the Interviewers' assessments; this may in part be due to the absence of any explicit reference to it on the interviewers' proformas, but is nevertheless surprising, given that many interviewers specifically ask candidates about such topics at interview, and hence it might have been expected to manifest somewhere in the assessments.

As in the analyses of chapters 3 and 4, one may ask how the interviewers' judgements relate to background variables (Table 5-7). In addition to those used in the previous studies the four personality scores derived from the EPQ, the state anxiety score derived from the STAI, and two variables indicating whether a candidate completed Q2 before or after interview, and the interaction of that latter variable with state anxiety have also been included.

The Interviewers' assessment of factor I (Non-academic suitability) correlated positively with mean 0-level grade, with Oxbridge application, with private sector education and with extraversion; previous UCCA applicants scored less well on this dimension.

The Interviewers' assessment of Factor II (Academic suitability) correlated highly with mean 0- and A-level grades, and also correlated positively with Oxbridge application, early UCCA application and being female; candidates were rated less well if they were having a courtesy interview, if there was unsolicited information with the UCCA form, if they came from a medical family or if they had applied to UCCA previously.

Many of the predictor variables inter-correlate with one another and hence hierarchical multiple regressions, in which the interviewers' assessments are related to all of the background variables, were carried out. At each step the variable was chosen from those remaining which provided the best additional prediction of the dependent variable independently of those already in the analysis (Table 5-7). For Factor I (Non-academic suitability) it can be seen that successful applicants are extraverts with low psychoticism scores, high mean 0-level grades, applications to Oxbridge and a high proportion of London medical schools, have not previously applied to UCCA, and are not having courtesy

interviews. Scoring well on Factor II (Academic suitability) is correlated with having high 0- and A-level grades, with having taken Biology A-level, and with being a mature applicant; it is correlated negatively with having a courtesy interview, having unsolicited information with the UCCA form, or having applied previously to UCCA.

Given that the interviewers are making three separate judgements, how are those judgements combined together to form an overall recommendation, and is that recommendation based entirely upon those judgements, or do other background variables also enter into the recommendation? Table 5-8 shows a two-stage multiple regression of the board's recommendation. In the first stage the three interviewers' factors are entered, and it can be seen, as in Table 5-5, that Non-Academic suitability is the major determinant of success, that Academic suitability is of lesser importance, and that the third factor, Health, is of no significant effect (being almost invariably good). In stage II all of the background variables were entered in a hierarchical analysis; only two of them are significant at the 5% level, and it is probable that these represent a type I error, since the addition of all the remaining background variables in Stage II does not result in a

significant improvement in fit ($F(35,229) = 1.336$, NS). One may thus conclude that the interviewers' recommendation is based entirely upon the individual components of their assessment.

As in chapter 4, one may also ask how the interviewers' assessments relate to the students' own descriptions of their attitudes and culture, using the scales described in chapters 8 and 10. Table 5-9 shows the relationship of the interviewers' assessments to the attitude scales; none of the correlations are significant at the 0.05 level for these 300 interviewees, perhaps a surprising finding given that interviewers' factor 2 is assessing 'Non-academic suitability', which could well be expected to relate to attitudes. A generous interpretation might be that the interviewers are being singularly fair in avoiding the confusion of personal suitability with attitudes to moral and ethical problems, although an alternative explanation is simply that interviewers are not particularly good at making such assessments in the limited time available at a short interview. Table 5-10 shows the correlations of the culture measures with the interviewers' ratings of the interviewees. Only one correlate is significant at the 0.01 level; high Academic suitability correlates negatively with 3:Travel; once more, as in chapter 4, the implication is that a large amount of travel is seen to reflect badly upon a candidate, perhaps because it is felt that it is put on the application or in the interview to cover a lack of more substantial interests.

Entrants to interviewing, and non-interviewing schools.

Not all medical schools interview most of their entrants. A crucial question therefore in assessing the role of the interview in student selection, is whether entrants to interviewing schools differ from those

entering non-interviewing schools. An answer to this question has been attempted by considering all applicants in the survey who eventually entered non-London, non-Oxbridge medical schools in England and Wales, dividing them into those going to interviewing schools (n=83) and those going to non-interviewing schools (n=28).

Despite the small sample size, a hierarchical discriminant analysis distinguished entrants to the two school types, on the basis of all of the background variables used in chapter 3, and all of the variables extracted from the Dean's assessment of the UCCA form (chapter 4), a total of 33 variables. The criterion for entry into the discriminant function was a significant improvement ($p < 0.05$) in Rao's V. Four variables provided a significant discrimination; entrants to non-interviewing schools scored significantly lower on the Dean's assessment of 'Interests' ($p = 0.0059$) and significantly higher on the Dean's assessment of 'Academic Ability' ($p = .00125$); they were also more likely to have unsolicited correspondence with their UCCA application forms ($p = .0094$) and to come from the North of Britain ($p = .0091$). These significant results are not type I errors since a discriminant analysis based on all the variables was highly significant (Wilks' Lambda = .677, $p < 0.001$).

Unfortunately insufficient St. Mary's interviewees, who had completed Q2, were admitted to these medical schools to allow any useful comparison of the contents of Q2.

<u>Discussion.</u>

From this analysis of interviewing at one medical school it is clear that despite some inevitable biases of assessment, and of external influences upon the making of judgements, that interviewers make broadly similar judgements of Academic and non-Academic Suitability for studying medicine, and that the latter was in general of greater importance in determining their recommendation. This contrasts with the assessments made by the Dean from the application form (chapter 4) where Academic Ability was of relatively greater import, reflecting in part the rather different pool of applicants being considered. That entrants to non-interviewing schools are differentiated from entrants to interviewing schools by having better Dean's assessments of Academic Ability but a lower rating of 'Interests' supports the contention of most interviewers that they are considering broader factors than simply academic ability in coming to their decisions. It would also provide support for the suggestion (McManus, 1982a) that a partial explanation of the increasing

A-level grades of entrants to medical schools is the associated diminished use of interviews in selection. The utility of interviewing is also supported by two American studies; in one (Rippey <u>et al</u>, 1981) the MCAT (Medical College Admission Test) was only useful at predicting academic (i.e. exam) performance in the clinical years, whereas clinical performance was better predicted by interview results, and in the other (Nurden <u>et al</u>, 1978) interviewers' assessments were better at predicting intern performance than were MCAT results. In addition the study of Benor <u>et al</u> (1984) has shown that in an Israeli medical school which uses interviews, etc. to emphasise the personal characteristics of applicants, rejected applicants showed lower moral reasoning scores than did those accepted; in contrast a school using purely academic criteria for admission showed no such differences between acceptances and rejects.

Figure 5-1: Shows the frequency with which the chairmen and the two interviewers used the various response categories on the rating scales. Coding of responses: <u>Health</u> 1: Good; 2: Doubtful, 3: Bad; <u>Academic Ability</u> 1: Adequate; 2: Doubtful; 3: Not adequate; <u>Personality</u> 1: Suitable; 2: Doubtful; 3: Not suitable; <u>Potential contribution</u> 1: Good; 2: Moderate; 3: Small; <u>Potential</u> 1: High; 2: Medium; 3: Low; <u>Recommendation</u> see text.

Health   Academic ability   Personality   Potential contribution   Potential   Recommendation
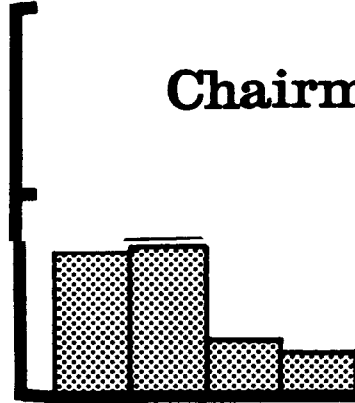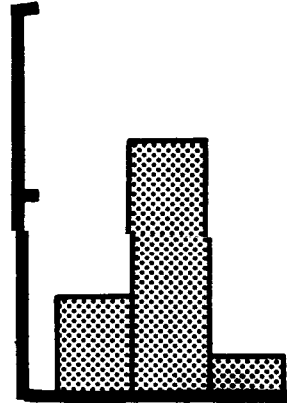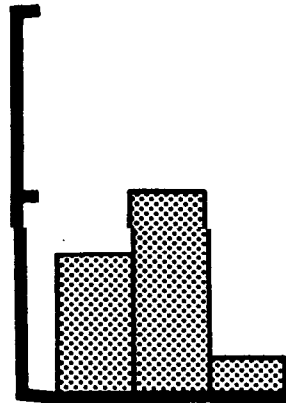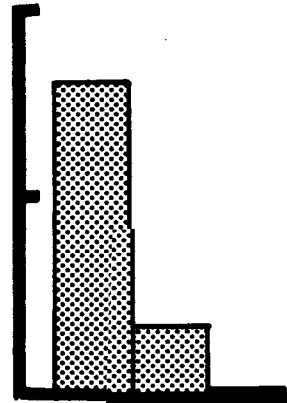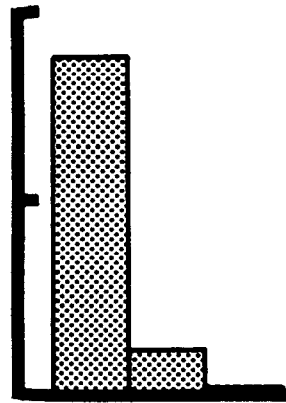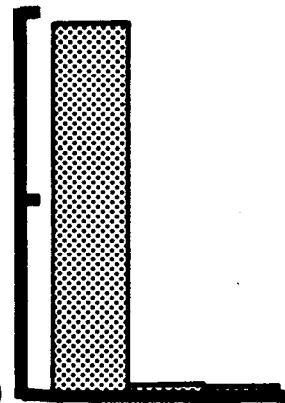
Chairman
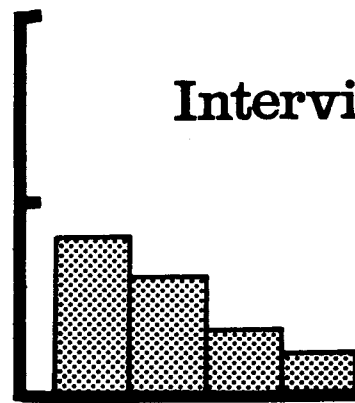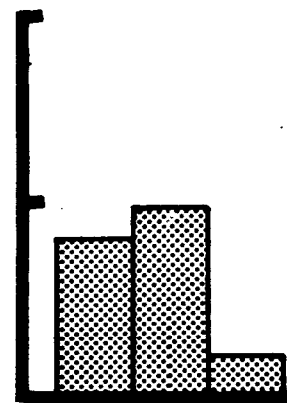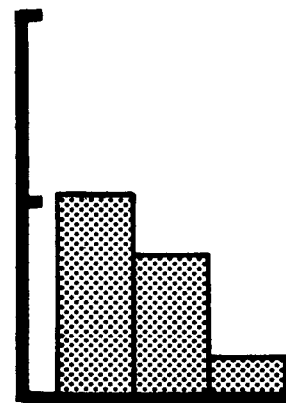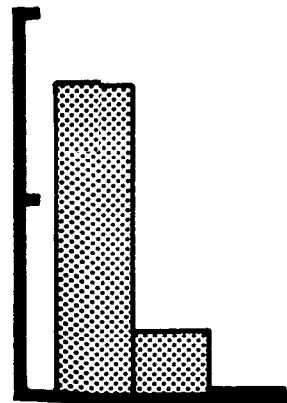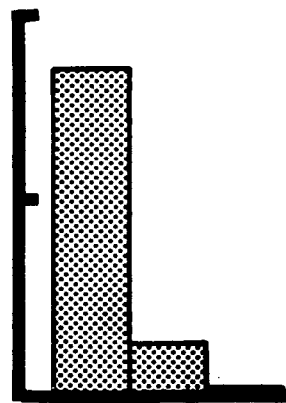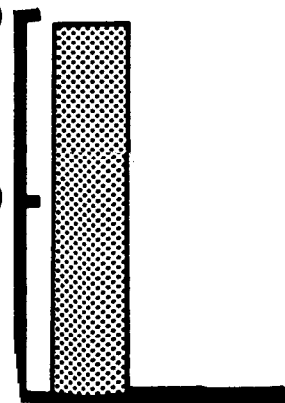
Interviewers

1 2 3   1 2 3   1 2 3   1 2 3   1 2 3   A B1 B2 C

Figure 5-2: Shows the individual recommendations of the four chairmen, the recommendations of the two interviewers, according to the identity of the chairman, and the board recommendation according to the identity of the chairman of the interviewing board (A,B,C,D).
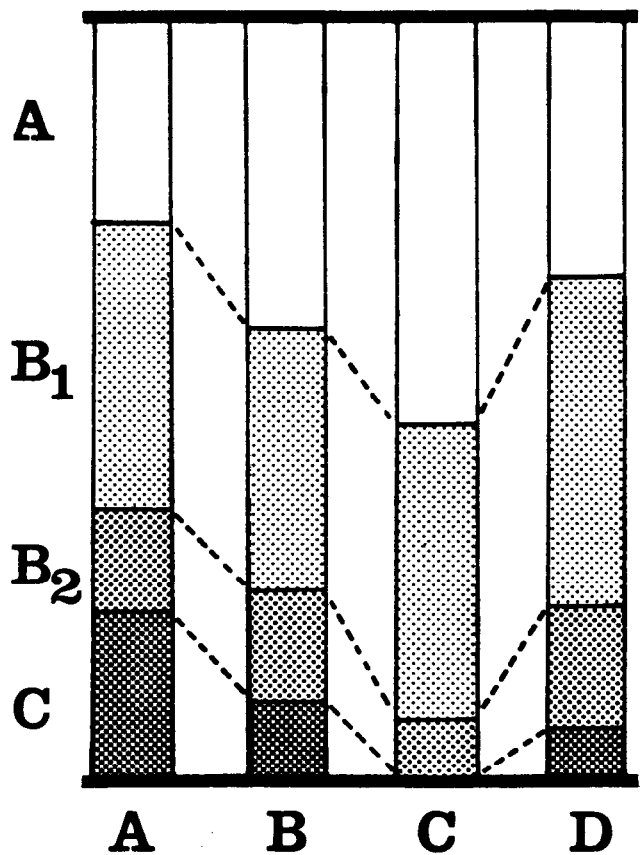
Chairman   Interviewers   Panel
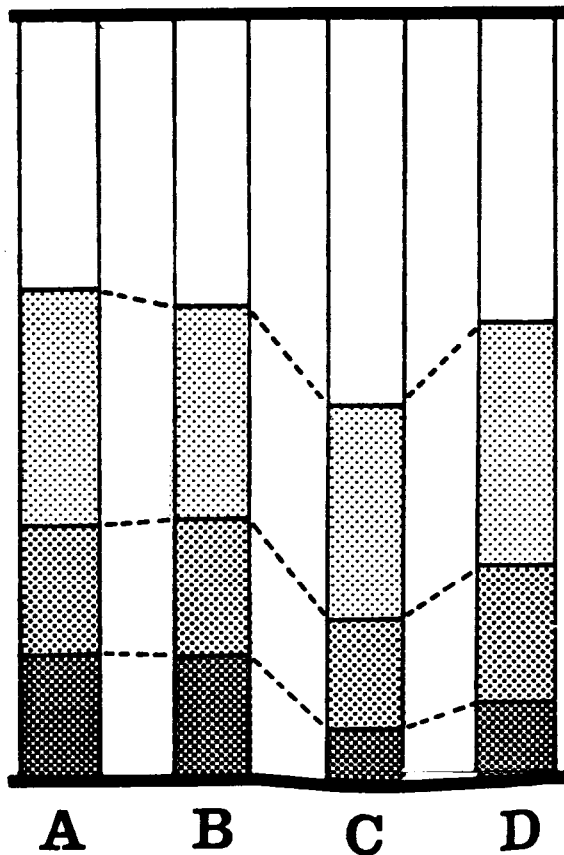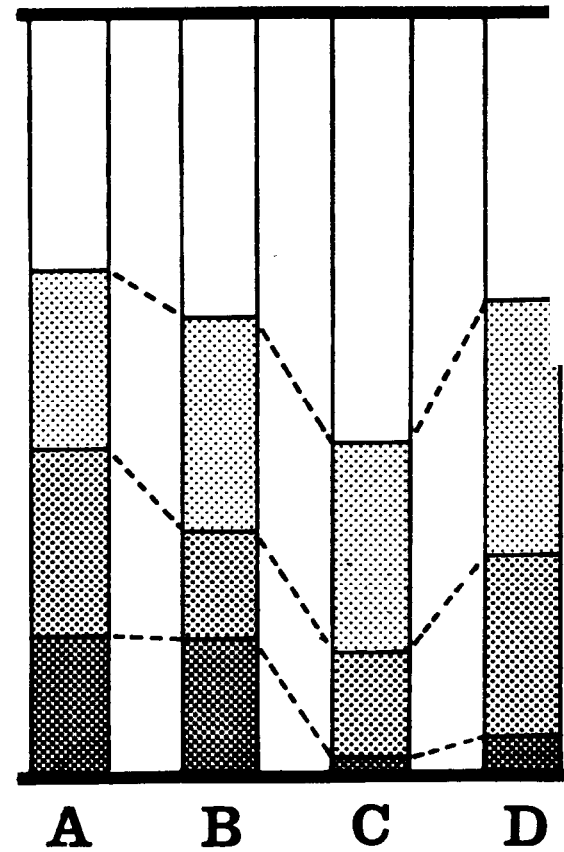
Table 5-1: Shows the results of a chi-square test for significant differences in linear trend between the frequency with which various pairs of interviewers used the response categories.
(*: p<0.05; **: p<0.01; ***: p<0.001).

Chi-square (1 df).

	Chairman vs Interviewer #1	Chairman vs Interviewer #2	Interviewer #1 vs Interviewer#2
Academic ability	.34	1.92	.70
Personality	.26	.43	1.28
Potential contribution	9.04 **	13.47 ***	.42
Potential	4.34 *	14.36 ***	2.52
Recommendation	.01	.37	.24

Table 5-2: Shows agreement between interviewers' judgements of candidates, using the gamma statistic. (***: p<0.001)

Scale	Chairman with Interviewer #1	Chairman with Interviewer #2	Interviewer #1 with Interviewer #2
Health	.992 ***	.991 ***	.993 ***
Academic ability	.735 ***	.769 ***	.883 ***
Personality	.726 ***	.781 ***	.794 ***
Potential contribution	.582 ***	.637 ***	.673 ***
Potential	.576 ***	.616 ***	.673 ***
Recommendation	.745 ***	.735 ***	.788 ***
Number of interviews	331	305	305

Table 5-3: Agreements on recommendations between interviewers.

Chairman

		A	B1	B2	C
	A	89	29	5	2
	B1	44	57	22	4
Interviewer #1	B2	3	9	22	11
	C	1	7	10	16

Chairman

		A	B1	B2	C
	A	82	28	7	2
	B1	39	53	20	5
Interviewer #2	B2	4	7	16	14
	C	0	4	7	17

Interviewer #1

		A	B1	B2	C
	A	95	27	4	3
	B1	28	43	19	4
Interviewer #2	B2	3	15	20	13
	C	0	5	7	19

Table 5-4: Shows the eventual destination of candidates
according to the panel's recommendation at interview.

Group	N	(%)	Offer made	Destination group Oxbridge	St. Mary's	Other London	Non-London	Non-medical	Not accepted	Overall acceptances
All interviewees	336	(100%)	60.7%	8.0%	25.0%	24.1%	12.8%	6.5%	23.5%	75.0%
Panel's Recommendation:										
A: Take	138	(41.1%)	97.8%	15.9%	34.1%	26.8%	8.0%	2.2%	13.0%	84.1%
B: Take if possible	102	(30.4%)	61.8%	2.9%	30.4%	25.5%	13.7%	7.8%	19.6%	71.6%
C: Waiting List	59	(17.6%)	5.1%	0.0%	8.5%	18.6%	18.6%	11.9%	42.4%	45.8%
C: Reject	33	(9.8%)	3.0%	6.1%	0.0%	21.2%	15.2%	12.1%	45.5%	42.4%
Undecided	4	(1.2%)	50.0%	0.0%	25.0%	0.0%	50.0%	0.0%	25.0%	75.0%

Table 5-5: Shows a factor analysis of the averaged scores of the three interviewers, after Varimax rotation. The three factors together explain 84.6% of the total variance.

	Factor		
	I	II	III
	'Non-academic suitability'	'Academic suitability'	'Health'
Health	.074	.058	.994
Academic ability	.210	.953	.160
Personality	.823	.062	.189
Potential contribution	.877	.079	.088
Potential	.770	.427	-.017
Recommendation	.846	.398	.053
Percent common variance	55.3%	24.9%	19.8%

Table 5-6: shows the inter-correlations betweeen the
Dean's three judgements of applicants and the
interviewers' combined judgement of the candidates.
(+: p<0.1; *: p<0.05; **: p<0.01; ***: p<0.001).

Interviewers' Judgments

	I Non-academic suitability	II Academic suitability	III Health
I Academic ability	.0447	.3820 ***	.1015 +
Dean's judgements II Interests	.3393 ***	.0229	.0508
III Community Service	.0335	−.0106	.0719

Table 5-7: Shows a hierarchical multiple regression of the
Interviewers' first two factors. UK nationals only.
Variable descriptions have been modified so that all beta
values are positive.

Order Variable   Beta

Dependent variables = Factor I (Non-academic suitability)

Order	Variable	Beta	
1	Higher mean 0-level grade obtained	.196	<.001
2	Higher EPQ Extraversion score	.179	.005
3	Oxbridge application on UCCA form	.219	.003
4	Lower EPQ Psychoticism score	.136	.024
5	No previous UCCA application	.133	.035
6	Higher number of London medical schools on UCCA form	.135	.027
7	Not a courtesy interview	.113	.047

Dependent variable = Factor II (Academic suitability)

Order	Variable	Beta	
1	Higher mean 0-level grade obtained	.413	<.001
2	Not a courtesy interview	.294	<.001
3	No unsolicited information with UCCA form	.179	<.001
4	Higher mean A-level grade obtained	.257	<.001
5	Mature applicant	.142	.019
6	No previous application to UCCA	.137	.004
7	Biology A-level taken	.090	.046

Table 5-8: Shows a hierarchical multiple regression of the interviewer's recommendation as a function of the interviewer's first three factors, and all other background variables.

Order	Variable	Beta	p
	Stage I.		
1	Higher score on factor I (Non-academic suitability)	.787	<.001
2	Higher score on factor II (Academic suitability)	.296	<.001
3	Higher score on factor III (Health)	.045	NS
	Stage II.		
4	Maths A-level taken	.070	.036
5	No unsolicited information with UCCA form	.071	.035

Table 5-9: Correlations of interviewers' judgements with ethical attitudes of applicants. (N=300).
+: p<0.10; *: p<0.05; **:p<0.01; ***:p<0.001.

		Interviewers' judgements.		
		I	II	III
		Academic suitability	Non-academic suitability	Health
Ethical attitude Factor:				
1	"Vital libertarianism"	.049	.009	.035
2	"Social tough-mindedness"	-.034	.041	-.009
3	"Liberalism"	-.024	-.042	.065
4	"Personal libertarianism"	-.037	-.068	-.015
5	"Economic conservatism"	-.080	.102 +	.026
6	"Medical control"	-.015	.040	-.010
7	"Sex education"	-.057	.038	.047
8	"General Practise"	.061	.028	.004
I	"Libertarianism"	.000	.001	.048
II	"Tough-mindedness"	-.032	.061	-.021

Table 5-10: Correlations of interviewers' judgements with culture scores of applicants. (N=300).
+: $p<0.10$; *: $p<0.05$; **:$p<0.01$; ***:$p<0.001$.

	Interviewers' judgements.		
	I Academic suitability	II Non-academic suitability	III Health
Culture Factor:			
1: Literary culture	-.067	-.055	.036
2: Low-brow culture	.059	.001	.035
3: Travel	-.149 **	.015	-.039
4: Popular culture	.126 *	.054	-.031
5: Non-literary culture	-.105 +	-.006	-.027
'Culture'	-.097 +	-.027	.019

6:Interests, attitudes, personality
and career preferences.

"A knowledge both of books and human kind"

        Pope, Essay on Criticism, III, 640.

"Much was believed, but little understood,

And to be dull was constru'd to be good".

        Pope, ibid, III, 689.

"Sense of vocation? But in the applicant of,
say, 17, whose interests and personality are not
fully moulded, this is often fleeting. (We are
told that at this age about half the applicants
intend to become surgeons, while the other half
want to be psychiatrists!)."

        Lancet editorial (Anon, 1948).

Summary.

Successful and unsuccessful applicants for medical school entry were compared in the St. Mary's study on a wide range of scales assessing personality, hobbies, interests and travel, interests in medicine, and ethical and political attitudes. With one or two minor exceptions, no substantial differences were found between those accepted and those rejected. It is concluded that the particular attitudes and career preferences found in medical students and doctors cannot be ascribed to any substantial extent to the selection system.

A recurrent theme in studies of medical student selection is that by concentrating on academic qualifications medical schools select a certain type of entrant who has a particular set of attitudes, and veers towards certain careers. The implication is that doctors would be produced with different attitudes, if only some of the rejected applicants had been accepted, and that these doctors would <u>inter alia</u> have a more positive approach to the 'Cinderella' specialties of medicine. Concern has also been expressed that emphasis on success in scientific examinations, breeds narrow-minded specialists, lacking the broad interests that contribute to the humanistic base of medicine.

Career preferences of doctors and medical students have been studied for a number of years (see Hutt, 1976, for a review), the earliest large-scale studies being those carried out by ASME (see Martin and Boddy, 1962; Last and Stanley, 1968), much of which was reported to the Royal Commission on Medical Education (1968). Since then Parkhouse in particular has been responsible for a series of annual studies of career preferences in newly qualified doctors (see Parkhouse et al, 1983 for a review). Similar studies have been carried out in America (e.g. Gough, 1975). Such studies of career preference are of limited interest if the preferences are not stable, since they will have limited predictive value (at least in individuals, although they may nonetheless still be useful for large-scale social planning). Parkhouse (1976) and Parkhouse and Howard (1978) carried out follow-up studies after 2 to 4 years and found that about 65% of students and doctors retained their first choice of speciality. Shuval (1980; p.177) found broad stability of preferences over a seven year follow up of medical scchool entrants. Egerton (1983) found a somewhat smaller degree of consistency, and Zimny (1980) claimed to have found predictive validity of a career preference inventory in America. Almost no studies have examined career preferences of entrants

to medical school, the Royal Commission on Medical Education (1968) being an exception; preferences of entrants were very similar to those of finalists. The reasons for choosing particular careers have also been little studied, although there are suggestions of personality effects, particularly in the case of potential psychiatrists (Davies and Mowbray, 1968), although potential physicians have also, for instance, been described as more neurotic and introverted than other students, and different religious groups have been reported to have different career preferences (Koss, 1969). In an American study, Katz et al (1984) have emphasised the role of negative factors in changing career choice; 84% of students had changed a preference because of a factor they didn't like in a previous choice rather than because of a positive factor in their new choice.

In this chapter the attitudes, interests and career preferences of applicants in the St. Mary's Hospital Medical School survey of Medical Student Selection, who were accepted by St. Mary's or by one of their other choices, are compared with those who were rejected by all their chosen schools.

Method.

1478 applications were received by St. Mary's for admission in October 1981. All of those applicants with UK addresses were sent questionnaire 1 (Q1) (n=1361), and of these questionnaires 1151 (84.5%) were returned. 338 applicants were interviewed and all were invited to complete questionnaire 2 (Q2); all but one did so. A further 13 candidates were made offers without interview having been interviewed the previous year; all were sent Q2 by post, and seven questionnaires were returned. Q1 contained questions concerning attitudes towards careers,

interest in particular aspects of medicine, and possible destination if not accepted for medical school; Ql also contained a syllabus-boundness questionnaire (Lucas et al, 1976), which assessed the degree to which the applicant preferred to work on his own or stick rigidly to a syllabus. Q2 contained detailed questions concerning interests, hobbies, travel, reading habits, and political, ethical and social attitudes, as well as the Eysenck personality questionnaire (EPQ: Eysenck and Eysenck, 1975), and the State-Trait Anxiety Inventory (STAI: Spielberger et al, 1970). It should be noted that respondents to Q2 are not a random sample of the total applicants but are a complete sample of those interviewed at St. Mary's.

Applicants were divided into those who were accepted for any British medical school for October 1981, and those who were rejected for medical school.

Personality.

Table 6-1 shows the responses on the personality inventories of those accepted and rejected. There is no evidence that those accepted are different from rejects on the dimensions of the EPQ, the STAI, or the syllabus-boundness scale. Both those accepted and those rejected differed from the approximate age-norms derived from the test manuals: they were more extravert, less neurotic, less psychotic, and had slightly higher lie (or social acquiescence) scores than the age-sex matched population as a whole, judged by their responses to the EPQ and on the STAI they had lower trait anxiety scores than the norm (but higher state anxiety scores since, of course, half of them were just about to be interviewed). The frequency distributions of state anxiety scores of pre- and post-interview candidates are shown in figure 6-1, in which they

are also contrasted with the norms from the manual, and with the scores of second-year St. Mary's undergraduates taking *a* 2nd MB viva examination. The interviewees are in general about three years younger than the examinees but are otherwise similar in background and qualifications. The mean anxiety scores of <u>viva voce</u> candidates (males 53.6; female 60.7) were slightly higher than for the most stressful manipulation reported on American college students in the manual for the STAI ('the students viewed a stressful movie depicting several accidents in a woodworking shop'; Spielberger et al, 1970) (t=1.89, 73 df, p<0.1), and were substantially higher than for American college students taking an IQ test (t=10.35, 73df, p<<0.001). By contrast, the anxiety levels of interviewees were only mildly raised (although the significant difference between pre- and post-interview applicants (t=4.54, 325 df, p<0.001) confirms the face validity of the method of assessment), and were significantly lower in each case than for pre-viva students (t=9.29, t=12.28, 325 df, p<<0.001, p<<0.001 respectively).

Interests in medicine.

Q1 contained a series of questions concerning the candidates' interests in various aspects of medicine, most of which were based on questions used by the Royal Commission on Medical Education (Royal Commission, 1968). Table 6-2 shows the results of a question in which applicants were asked to rank six aspects of medical education in terms of their interest to them. The only difference was that rejected candidates rated interest in learning about the physical aspects of disease more highly (p<0.001).

Three separate questions were asked about career preferences. Firstly, a very general question enquired about how certain the candidate was about a particular career choice (Table 6-3). Most candidates had some idea of a career, but were far from committed to it; those accepted were less certain about their eventual career ($p<0.001$).

The second question (Table 6-4) asked how interested candidates were in various broad areas of medicine, each being rated on a four-point scale. The majority of candidates were most interested in hospital work. There were only minimal differences between acceptances and rejections, with those accepted being slightly more interested in hospital work and slightly less interested in non-clinical work.

The third question gave a list of 24 possible specialties and asked each candidate to rate his interest in each on a five-point scale (Table 6-5). There were only three differences between acceptances and rejects significant at the 5% level; in view of repeated significance testing these results probably represent a type I error, and are thus not truly significant.

Finally, all applicants were asked what they would do if they should be rejected for medical school that year (Table 6-6), seven possible options being rated on a four-point scale, with an eighth option indicating 'other'. The majority of candidates were considering re-applying in the next year, and would probably be re-taking A-levels as well. Three significant differences emerged between acceptances and rejects; accepted candidates were less likely to intend applying for medicine again, less likely to intend retaking A-levels, and less likely to intend applying to study a non-biological science at university.

<u>Interests and Attitudes</u>

Q2 asked a number of questions about hobbies, interests and attitudes. More detailed accounts may be found in chapters 9 and 11.

Table 6-7 summarises the answers to a number of questions on recreation time; the 'Reading score' is a summary of forty questions concerning particular authors that the candidate might have read. There are probably no significant differences between acceptances and rejects on any of the items of Table 6-7, when repeated significance testing is taken into account. Table 6-8 shows the travel experience of applicants; no significant differences were found between acceptances and rejects. A more detailed multivariate analysis of these data is reported in chapter 11.

A total of 112 questions were asked concerning moral, ethical, social and political attitudes, other aspects of which are considered in chapter 8. Each attitude question asked for a response on a four-point scale, "Definitely Yes", "Probably Yes", "Probably No", or "Definitely No". A factor analysis of the responses of these and other intending or actual medical students, revealed eight specific response dimensions, and two super-ordinate response dimensions. These two dimensions have been labelled 'Libertarianism' and 'Tough-mindedness'; they are superordinate only to factors 1 to 5, while factors 6, 7 and 8 are independent of them. Scores on these factors were standardised so that the entire reference population of over 1500 questionnaires completed by over 1300 medical students (from all pre-clinical and clinical years) and prospective students (including the present ones) gave a mean of zero and a variance of unity for each independent factor. Table 6-9 shows the scores of acceptances and rejects on these scales.

Discriminant analysis of the eight factors and two super-ordinate factors showed that only factor 6 discriminated between those accepted and rejected (p<0.001). Factor 6 has been labelled 'Medical control' since it is primarily concerned with the control of medical practice; those rejected were therefore more in favour of stricter control of barbiturate prescription and ECT, were in favour of euthanasia, would welcome more information about medicine in the newspapers, were in favour of patients being given more information about their illnesses, and were sympathetic to sociological and psychological aspects of medicine. In interpreting this factor it should be noted that during passage through medical school, medical students tend to become more negative on factor 6; it is therefore possible that a high positive score primarily indicates immaturity concerning medical problems, although other more Machiavellian explanations could also be offered.

In view of the inter-relation between ethical and moral views, and religious beliefs, candidates were also asked to describe their religious views, and to indicate how frequently they attended church (Table 6-10). There were no significant differences between those accepted and rejected.

Conclusions.

Most of the findings in this chapter are negative, but important nonetheless. There is little evidence that candidates accepted by the medical school selection system differed systematically from those rejected, at least in terms of the items assessed here. The only exception to this is in the attitudinal dimension described as "Medical control", and the interpretation of that item is not clear. It could also be argued from the greater determination of those eventually

rejected to reapply for medicine and to retake A-levels that those rejected were more highly motivated, but it might also be that they thought that they were less able academically. The study has no information on the attitudes of those who were rejected before interview but there is no reason to suppose that they differed substantially from those invited to interview. It is concluded that the particular attitudes and career preferences found in doctors and medical students cannot be ascribed to any substantial extent to the selection system. Furthermore judged, for instance, from the rank ordering of careers in Table 6-5, which is very similar indeed to that of newly qualified doctors (Parkhouse et al, 1983), these particular preferences are not inculcated at medical school, but are a general attribute of applicants, apparently acquired before selection.

a.

┌Relaxation
　┌Normal
　　┌IQ test
　　　　┌Accident film

b.

┌Pre-viva

14
12
10
8
6
4
2
0

c.

┌──Post-┐
┌─Pre ─┘interview

30

20

10

0

20- 26- 31- 36- 41- 46- 51- 56- 61- 66- 71- 76-80

State anxiety
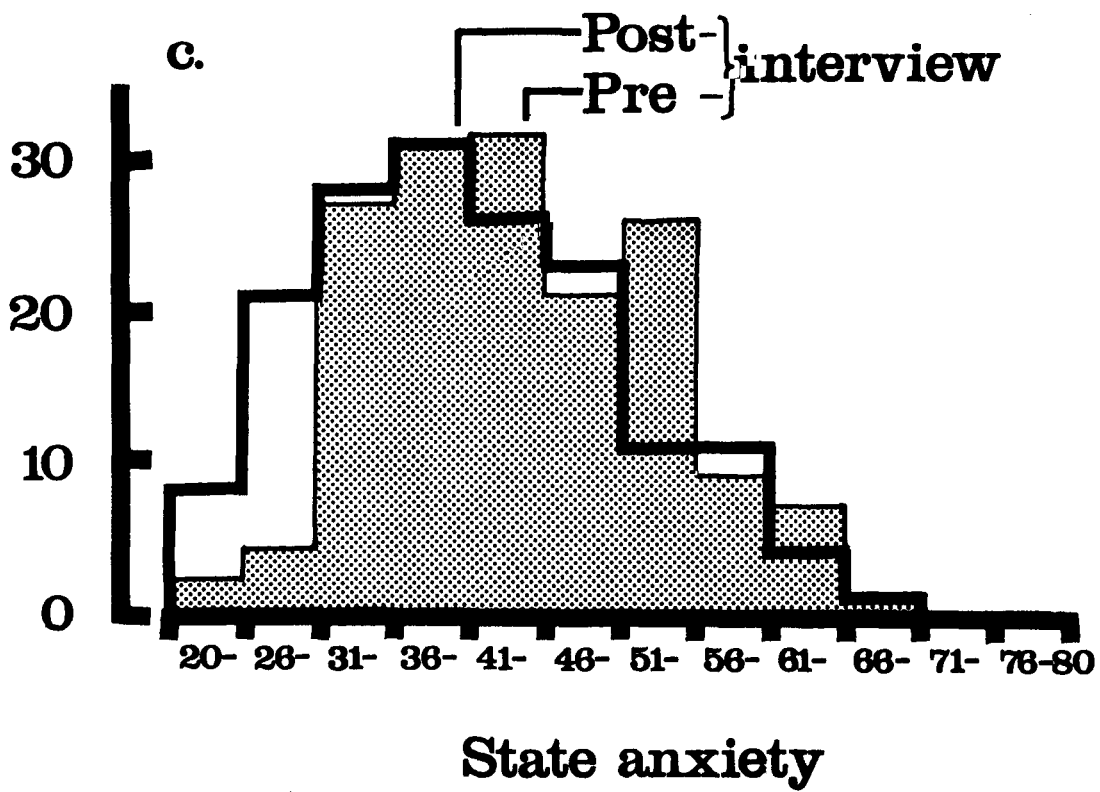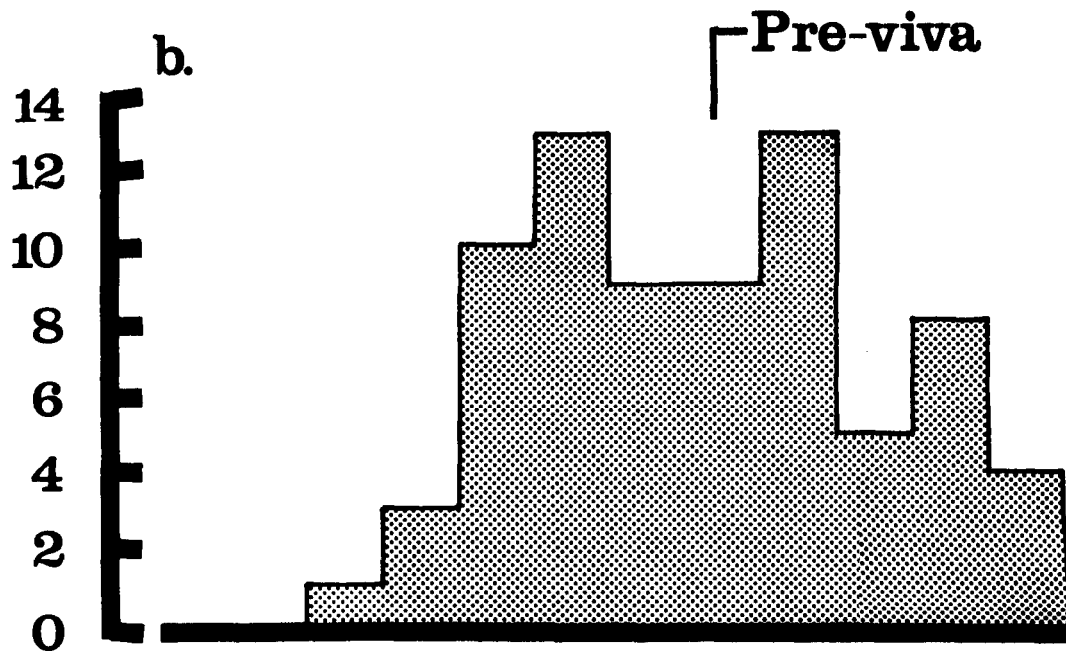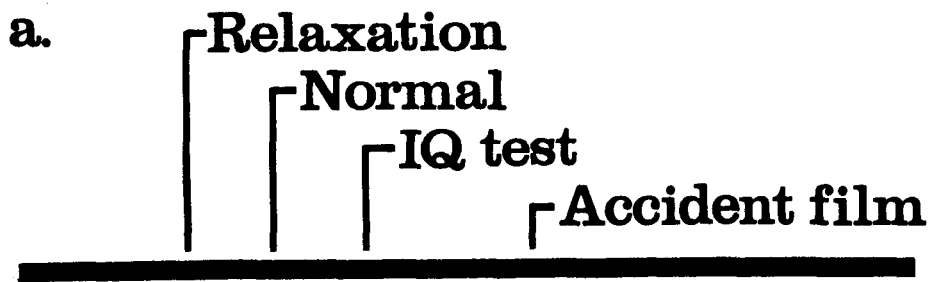
Table 6-1: Shows mean (SD) scores of accepted and rejected applicants on personality assessment scales.

	Rejected N=99	Accepted N=225	Sig	Approx. age norms
Eysenck Personality Questionnaire				
Extraversion	15.68 (3.55)	15.13 (3.66)	NS	14.0 (4.4)
Neuroticism	9.34 (4.25)	9.35 (4.74)	NS	11.7 (5.1)
Psychoticism	2.24 (2.06)	2.36 (2.22)	NS	4.0 (3.0)
SSE scale (Social acquiescence)	7.41 (3.92)	6.89 (3.98)	NS	6.3 (3.8)
State-Trait Anxiety Inventory				
State anxiety	42.19 (9.67) n=105	n=232	NS	37.2 (10.1)
Trait anxiety	35.51 (5.97) n=79	36.32 (5.94) n=171	NS	40.2 (10.1)
Syllabus-boundness	23.72 (3.35) n=592	23.92 (3.23) n=400	NS	-

Table 6-2: Shows the mean (SD) ranks allocated to six aspects of medical specialisation by accepted and rejected applicants.

	Rejected N=558	Accepted N=416	Sig.
Learning about the physical aspects of disease	1.98 (1.03)	2.28 (1.31)	<0.001
Learning how to take responsibility for patients	2.97 (1.48)	2.94 (1.49)	NS
Learning about the psychological aspects of disease	3.42 (1.52)	3.29 (1.50)	NS
Learning how to carry out complex operations on patients	3.63 (1.79)	3.80 (1.72)	NS
Learning about the social aspects of disease	4.24 (1.46)	4.28 (1.52)	NS
Learning about research	4.39 (164)	4.36 (1.64)	NS

Table 6-3: Responses of accepted and rejected candidates to the question, 'Have you decided on the nature of an eventual career in medicine?'

	Rejected N=569	Accepted N=429
Yes, definitely	8.8 %	5.1 %
Yes, I have inclinations towards a certain field, but have not finally decided.	64.3 %	55.2 %
No, but I have firmly decided against some kinds of work	10.7 %	16.1 %
No, I am quite undecided	16.2 %	23.5 %

$$X^2 = 20.16, p < 0.001$$

3

Table 6-4: Shows the mean (SD) degree of interest expressed by accepted and rejected applicants in six broad areas of medical work. Scores of 1, 2, 3 and 4 indicate responses of 'Very interested', 'Fairly interested', 'Not very interested', and 'Uninterested'.

	Rejected N=570	Accepted N=430	Sig.
Hospital or specialist work with continuing responsibility for patients	1.45 (.59)	1.39 (.58)	p<0.05
Clinical practice outside hospital e.g. general practice	2.00 (.83)	1.95 (.80)	NS
Basic medical sciences or original research	2.27 (.81)	2.32 (.78)	NS
Hospital or specialist work of a laboratory nature e.g pathology, microbiology, biochemistry.	2.49 (.90)	2.48 (.76)	NS
Hospital or specialist work without continuing clinical responsibility e.g. radiology, anaesthetics.	2.60 (.76)	2.61 (.71)	NS
Non-clinical work e.g. public health, medical administration.	3.39 (.70)	3.48 (.63)	p<0.05

Table 6-5: Shows the mean (SD) degree of interest in various specific careers shown by accepted and rejected applicants. Scores of 1,2,3,4, and 5 correspond to replies of 'Definite intention to go into this', 'Very attractive', 'Moderately attractive', 'Not very attractive', and 'Definite intention not to go into this'.

	Rejected N=511	Accepted N=384	sig.
Medicine in hospital (including cardiology, neurology, etc.)	2.45 (.69)	2.47 (.65)	NS
Surgery (including neurosurgery, thoracic surgery, etc.)	2.51 (.84)	2.56 (.81)	NS
Paediatrics	2.70 (.83)	2.66 (.77)	NS
General Practice (small partnership)	2.72 (.90)	2.74 (.81)	NS
Obstetrics & Gynaecology	2.79 (.83)	2.79 (.72)	NS
Traumatic and orthopaedic surgery	2.90 (.82)	2.89 (.76)	NS
Medical research	2.95 (.90)	3.02 (.81)	NS
General practice (large group or health centre)	3.07 (.86)	3.05 (.80)	NS
Pathology	3.01 (.77)	3.07 (.72)	p<0.1
Ear, Nose & Throat surgery	3.13 (.75)	3.07 (.71)	p<0.1
Psychiatry	2.98 (.85)	3.07 (.82)	NS
General practice single-handed)	3.12 (.85)	3.20 (.79)	NS
Forensic medicine	3.07 (.81)	3.21 (.75)	p<0.05
Basic medical sciences	3.27 (.75)	3.23 (.75)	NS
Laboratory medicine (e.g. microbiology, Chemical pathology, Haematology)	3.15 (.79)	3.27 (.74)	NS
Armed forces	3.10 (.86)	3.26 (.78)	p<0.05
Ophthalmology	3.32 (.68)	3.30 (.63)	NS
Dermatology	3.35 (.67)	3.38 (.62)	NS
Anaesthetics	3.36 (.73)	3.49 (.62)	p<0.05
Public Health, Social medicine	3.45 (.68)	3.50 (.66)	NS
Radiology/ Radiotherapy	3.52 (.62)	3.53 (.58)	NS
Industrial medicine	3.48 (.69)	3.59 (.62)	NS
Pharmaceutical industry	3.57 (.66)	3.59 (.62)	NS
Medical administration	3.66 (.59)	3.78	

Table 6-6: Shows the mean (SD) score of accepted and rejected applicants for possible alternatives if they are not accepted for medical school in the coming year. Scores of 1,2,3 and 4 correspond to responses of 'Definitely Yes', 'Probably Yes', 'Probably No', and 'Definitely No'.

	Rejected N=542	Accepted N=393	Sig.
Apply to medical school again next year	1.68 (.80)	1.79 (.82)	$p<0.01$
Retake your A-levels in order to obtain better grades	1.84 (.79)	1.96 (.78)	$p<0.01$
Apply to university to read another biological science	2.42 (.65)	2.48 (.64)	NS
Apply to university to study a non-biological science	2.65 (.54)	2.57 (.58)	$p<0.01$
Apply to university to study a non-science subject	2.75 (.48)	2.61 (.59)	NS
Apply to study a para-medical sbject e.g. nursing, physiotherapy	2.63 (.59)	2.68 (.55)	NS
Apply to university to study dentistry	2.76 (.48)	2.71 (.53)	NS

Table 6-7: Shows the mean (SD) activity of accepted and rejected applicants on a number of recreational activities.

	Rejected N=94	Accepted N=228	Sig.
Hours per week:			
Watching television	5.06 (3.33)	5.76 (3.92)	p<0.1
Playing sport	5.59 (4.75)	4.83 (4.14)	NS
In a pub	1.19 (1.32)	1.63 (2.60)	NS
On hobbies	5.85 (3.93)	5.33 (3.72)	NS
Percent who:			
Play for a team	64.7 %	59.8 %	NS
Play a musical instrument	54.3 %	47.8 %	NS
Occasions per year:			
Theatre	3.24 (3.15)	3.32 (3.41)	NS
Opera	0.74 (1.94)	0.60 (1.30)	NS
Ballet	0.43 (1.64)	0.56 (1.38)	p<0.1
Pop concerts	1.86 (2.13)	2.19 (3.01)	NS
Classical concerts	2.51 (3.22)	2.10 (3.40)	p<0.1
Art galleries	1.78 (2.17)	1.89 (2.20)	NS
Museums	3.03 (3.04)	2.63 (2.08)	NS
Cinema	5.91 (3.83)	6.17 (4.57)	NS
Football matches	2.12 (4.14)	1.66 (3.54)	NS
Cricket matches	1.50 (2.72)	1.62 (3.22)	NS
Parties	8.73 (4.96)	8.46 (5.03)	NS
Reading habits:	N=92	N=225	
Books per year:			
Fiction	15.16 (15.39)	17.27 (17.64)	NS
Non-fiction	10.68 (9.29)	9.87 (12.81)	p<0.05
Reading score			
(range 0 - 80)	11.84 (14.18)	9.95 (13.69)	NS

Table 6-8: Shows the percentages of accepted and rejected applicants who have travelled to various areas of the world.

	Rejected N=95	Accepted N=230
France	80.0 %	73.9 %
Germany	52.6 %	36.1 %
Italy	40.0 %	42.6 %
Switzerland	35.8 %	28.7 %
Holland	21.6 %	23.5 %
Belgium	30.5 %	24.8 %
Spain	29.5 %	34.3 %
Portugal	9.5 %	7.0 %
Greece	13.7 %	17.4 %
Scandinavia	11.6 %	8.3 %
Eastern Europe	14.7 %	9.1 %
Middle East/ N. Africa	13.7 %	12.2 %
Central-Southern Africa	6.3 %	4.3 %
India & Far East	9.5 %	7.8 %
Russia/ China	2.1 %	2.2 %
Australasia	4.2 %	3.9 %
North America	17.9 %	17.8 %
South America	2.1 %	1.7 %

Table 6-9: Shows the mean (SD) scores of accepted and rejected interviewees on the eight attitudinal factors and the two super-ordinate attitudinal factors.

Factor:

		Rejected N=103		Accepted N=236		Sig
1	"Vital libertarianism"	-.226	(.921)	-.060	(.857)	NS
2	"Social tough-mindedness"	-.028	(.837)	-.109	(.714)	NS
3	"Liberalism"	-.342	(.648)	-.535	(.638)	p<0.05
4	"Personal libertarianism"	-.188	(.806)	-.087	(.824)	NS
5	"Economic conservatism"	-.062	(.678)	-.218	(.706)	p<.10
6	"Medical control"	.468	(.650)	.181	(.642)	p<0.001
7	"Sex education"	-.006	(.882)	-.123	(.718)	NS

Supra-ordinate factors:

I	"Libertarianism"	-.366	(.866)	-.284	(.803)	NS
II	"Tough-mindedness"	.046	(.769)	.055	(.695)	NS

Table 6-10: a). Shows the stated religious belief of accepted and rejected applicants. b). Shows the stated number of times that candidates went to church each year.

	Rejected N=93	A N=222
Christian	65.6 %	66.2 %
Jewish	3.2 %	1.8 %
Agnostic	17.2 %	18.0 %
Atheist	12.9 %	9.5 %
Other	1.1 %	4.6 %

$$X^2_4 = 3.82, \text{ NS}$$

	Rejected N=94	A N=226
Every week	30.9 %	34.5 %
Once per month	14.9 %	12.8 %
3 - 10 times per year	20.2 %	11.9 %
Festive occasions only	23.4 %	20.8 %
Never	10.6 %	19.9 %

$$X^2_4 = 7.16, \text{ NS}$$

7. Applicants' perceptions and proposals for change.

 "...some of the fog of ignorance and mystique that so often cloaks medical school admissions should be dispersed, to the benefit of medical school admissions officers, those giving advice to prospective students, and - most important of all - the applicants".

Anderson, Hughes and Wakeford (1980)

Summary.

    Medical school applicants in the St. Mary's study were asked to comment freely on the process of selection. The majority of comments concerned excessive emphasis on academic achievement, the role of interviews, the problem of rank-ordering choices on the UCCA form, and possible biases in selection. As a result of such criticisms, and of the results of the survey, the major proposals for change are that even though it would make selection more difficult for schools, candidates should not rank their choices in order of preference, that as many applicants as possible should be interviewed to enable them to feel that their claim has been fully represented, that UCCA applications for medicine should be subject to an early closing date, that applicants should be encouraged to apply after taking A-levels, that graduates and mature students should be encouraged, not least by providing mandatory awards, and that every effort should be made to take into account educational opportunity in assessing A-level grades.

"... the medical profession seems to be biased towards the
very academic, probably male student, who has a long family
history in medicine and a public school education. They seem
in my experience less interested in your character and whether
you have the right temperament to make a good doctor and have
the ability to get on with and communicate with a wide range of
people, especially in a difficult situation"

Applicant to St. Mary's Hospital Medical School, 1980.

Applicants in the St. Mary's study were invited to enter "any
comments or criticisms of the medical school selection process" on a
blank sheet of the questionnaire, Q1, which was sent to all applicants
with an address in the UK on receipt of their UCCA application form at
St. Mary's.

Comments were made about the selection process by 623 of the 1151
applicants who completed Q1. A further 64 wrote that they felt unable to
comment usefully or commented on the survey itself, rather than on the
selection procedure. 45 of the 623 replied that the selection process
appeared to be as fair as possible in the circumstances of intense
competition for entry. This chapter concerns the points raised by the
remaining 578 applicants. Several respondents deliberately signed their
comment s and one even provided a telephone number "for fur ther
discussion".

Here are considered applicants' criticisms of the admission system,
and suggestions made for change, in the light of these criticisms and of
the findings of the survey.

<u>Results</u>

There were four major areas of concern (Table 7-1):

1.   Excessive emphasis on academic achievement

2.   Interviews

3.   Pressure to make an order of preference between medical schools

4.   Possible bias in selection

<u>1. Excessive emphasis on academic achievement.</u> 205 applicants considered that academic achievement was too dominant a factor in selection although a few admitted that they saw no practical alternative. Reservations were expressed on two major grounds: first, non-academic factors were thought to be at least as important as academic ability in determining suitability for a career in medicine; second, it seemed difficult to assess academic ability on a common standard. While no applicant denied that academic ability was necessary many other important characteristics were put forward (Table 7-2). One applicant commented, "It is so easy not to realise that there are real people outside our educational cocoon". Concern surrounded academic over-emphasis in general, the role of 'O' level achievement and the all-importance of specific 'A' level grades.

Several applicants were concerned that too much reliance may be put on 'O' level results in predicting academic ability at 'A' level and thereafter. Although the UCCA application form no longer requires specific prediction of 'A' level grades, applicants suspected correctly that if they had not already taken 'A' level their academic ability would

be judged as much on '0' level achievement as on any comments in the confidential report about progress in the first year of the 'A' level course. Their concern seems justified in that although those with excellent results at '0' level generally do well at 'A' level there are striking exceptions: high achievement at '0' level by no means necessarily ensures good 'A' level results, nor does poor '0' level achievement necessarily preclude an excellent performance at 'A'level. The nature of the work and capacity tested by the two examinations is different, the emphasis put on '0' level varies considerably between schools and pupils mature at different rates.

Applicants justifiably felt that they might be denied an interview or conditional offer because of indifferent '0' level results although in due course they might out-perform many of those who received offers. They correctly perceived that it is not always easy to break back into the system; failure to obtain a conditional offer at first application is likely to cost a year unless an individual is very fortunate at the "clearing" stage in August.

To emphasise the problem, Figure 7-1 shows the average A-level grade of applicants as a function of their average 0-level grade. Individuals with average grades of between A and B at 0-level gained a wide range of grades at A-level. Conversely an average A-level grade of B/C was

sometimes associated with an average 0-level grade as low as C/D. That few applicants offered a mean 0-level grade below a grade of C, probably reflects the policy of school sixth forms. The correlation between 0- and A-level achievements in Figure 7-1 is 0.59, which, however, implies that only 35% of the variance in A-levels is predicted in terms of variance in 0-levels, and hence individual A-level results cannot reliably be predicted from individual 0-level grades. The coefficient of

alienation, $(1 -\sqrt{1-r*r})$, which is a measure of the proportional reduction in the standard error of a prediction as a result of knowing a second variable, is 0.195; this coefficient corresponds more closely with psychological judgements of relationship than does the conventional correlation coefficient (Jennings et al, 1982). It should also be noted in passing that A-level achievement in UCCA applicants is predicted slightly more reliably by head-masters (r=0.65) than on 0-level achievement alone (r=0.52) (Murphy, 1981).

The rigid use of specific 'A' level grades as the final arbiter of acceptance was heavily criticised by applicants on the grounds that differences between grades were often so small as to have no real meaning, that the standards of examinations set by the different school examining bodies was not uniform, that different subjects were not strictly comparable, that age and educational opportunity were not properly taken into account and that 'A' level performance of those who did not receive conditional offers was adversely affected by such a serious blow to their self-confidence and motivation.

It is indeed true that the difference between a B and a D grade may represent very few marks and that a few marks can easily be determined by the luck of the questions or the health of the day, by, as Scrooge put it, "a slight disorder of the stomach ... an undigested piece of beef, a blot of mustard, a crumb of cheese, a fragment of an underdone potatoe". It is also true that the nature and very probably the standard of the 'A' level examinations set by different boards vary; it is not uncommon to find that applicants simultaneously achieve in the same subject a B in the examination set by one board and a D in another. A few applicants proposed the remedy of a common national 'A' level examination or a specific examination for entry to medicine.

Educational opportunity varies substantially: the quality of teaching, the constructiveness of the environment both at school and at home, and the pressure put upon pupils to achieve differ sufficiently for achievement at level and academic potential sometimes to be very different things. So difficult may it be to judge academic potential and motivation at age 18 that some applicants suggested that medical students should not be admitted under the age of 21, partly to allow more time for assessment of academic potential, partly to give opportunity for more practical experience and partly to ensure greater maturity.

2. Interviews. Not too much general importance can perhaps be attached to the fact that 206 applicants to a school which includes interviews as part of its selection process expressed views about interviews, most of them asking for at least as much weight to be given to interview as to academic qualifications. Applicants to schools which do not normally interview might reasonably express a contrary view.

The applicants saw interviews as providing a wider profile than was possible on an UCCA form, enabling applicants to become better informed about particular schools and courses, and particularly giving the opportunity to put their own case. Feeling on the latter point was strong: one person commented "how embittered an applicant can feel when 5 rejections come through the post without any contact with the schools"; another who had twice been rejected by all his five choices without interview wrote "I am not saying that I should have been accepted but I am saying that I should have been given the chance to be assessed at interview before rejection or acceptance".

It is easy to overstate the discriminant value of an interview but difficult to deny that applicants see it as important to have an opportunity to communicate "why you are applying and what sort of person you are", to show "aptitude for debating a point" and to "explain special circumstances". One applicant felt that interviews might well help to avoid the worst misfits:

> "I live with two medical students who possess the same qualifications (as I do) and have absolutely no interest in the course. Neither of them was called to interview and had no idea what the course involved. Is this due to a biased referee's report, parental influence or was the offer simply based on academic qualifications?"

Several applicants tempered their approval of interviews with a wish to make them more discriminating, while a few considered them unreliable because unconducive to truthful speaking, too stressful, too formal (or too informal), too short and raising false hopes. Some proposed an interview with two or three different panels to obtain fairer assessment by a wider spectrum of opinion, others suggested a longer period of assessment with practical tests of initiative and ability "to test more thoroughly the candidates' practical ability to handle practical problems". An approach to selection by questionnaire with or without interview was also suggested.

Interviewed or not, several applicants asked that they should be given reasons why they had been unsuccessful in obtaining an offer. The reason often was only that others were even better qualified.

3. Pressure to state an order of preference between medical schools.

Applicants are advised by their teachers that medical schools prefer applicants to list their choices in order of preference and that their best chance of serious consideration is at their first choice; it is

widely suspected but difficult to prove or disprove that some medical schools give scant consideration to applicants who did not place them first (or second to Oxbridge). 171 applicants were concerned at the pressure they felt on them to state an order of preference, partly because they felt unable to make a sufficiently informed decision and partly because they suspected that their chance of acceptance might depend on strategy in deploying their preferences. In its own survey UCCA also found evidence that applicants are dissatisfied with the need to place selections in order of preference (Fulton and Lamley, 1983).

Prospectuses were considered to give too little and biased information; "alternative" prospectuses written by students themselves or by outsiders would have been welcomed. The results of the Medical Student Environment Questionnaire (Wakeford, unpublished) might well provide much of the desired information. Difficulties in making arrangements to visit medical schools were mentioned and the high cost to many applicants of visiting five (or more) schools was emphasised. Applicants turned to their teachers, to their family doctor and to student friends for advice which they felt was often insufficiently well-informed or was not impartial. They had no way of discovering whether competition for entry differed substantially between medical schools, nor were they sure which schools would expect to be put first. One applicant described deciding an order of preference as "the greatest nightmare".

In chapter 2 it has been shown that the number of applicants per place varied considerably between different schools in 1980/81, although there is no convincing evidence, with the exception of Oxbridge, that it is more difficult to get into one medical school than another. It is difficult to estimate the importance of ranking of preferences upon

chance of admission at other schools; at St. Mary's those accepted had given the school slightly higher priority than those rejected (chapter 3). If, as is likely, all schools pay some attention to the candidates's stated preference it clearly is theoretically possible for a good average candidate who gives the first one or two preferences to schools which have a very large number of applicants in relation to their number of places, to be rejected by those schools and then to miss out at his lower preferences at which, given higher preference, he might have been successful. The applicants in the St. Mary's study were strongly in favour of a system of equal preference.

4. Bias in selection. Fewer fears were expressed about possible biases than about academic dominance, interviews and preference of medical school, but misgivings were expressed in particular about the influence of background, the weight given to possibly ill-informed confidential reports and possible bias against those re-taking 'A' levels to achieve better grades.

Possibly incited by questions in Q1 about parental background, 73 respondents were concerned that doctors' relatives might receive preferential consideration. A few expressed the view that if doctors' relatives were favoured then their additional insight into the demands of the job might justify special consideration. The analysis of chapter 3 suggests that, overall, doctors' children have a small advantage not accounted for by educational or other associated factors, a much smaller advantage than this applicant suspected:

> "I have never much liked the pre-occupation of many schools
> with a candidate's class and his father's occupation. Perhaps
> this is because I myself am working class and my father works
> in a factory. I know that if I were a doctor's son then my
> chances of acceptance would be much higher. I do not have a

single relative who is connected with medicine. I will be pleased and happy with the knowledge that any achievements made by me in this field will be entirely due to my own ability."

Other applicants were concerned about possible bias in favour of high social class or private sector education. A difference in favour of high social class was found only at Oxbridge and only a small bias was found nationally in favour of private sector education although it might have a greater influence in contributing to high 'A' level grades.

A number of applicants, especially those who had changed school at the age of 16, one year before making their UCCA application, were worried that their teacher responsible for the confidential report had insufficient personal knowledge of them. Here one may note a comment by Simpson (1972); "There is a most odd tendency on the part of British selectors to accept the headmaster's report as 'extraordinarily accurate' ... This is part of a general delusion of selectors; that they are able to use imperfect materials such as other people's opinions ... [and] somehow ... these base metals are transmuted into the finest gold."

Some medical schools do not admit students who fail to achieve their 'A' level target at first attempt and these candidates therefore feel discriminated against. Although St. Mary' s does not encourage re-application by those who failed to attain the maximum standard at first attempt, unless there was a special reason, there was no evidenceto suggested that they suffered overall. Those who had applied previously (not all of whom were re-taking 'A' levels) comprised 21.3% of applicants and 22.6% of acceptances in the survey. A small number ofoverseas and mature students felt at a disadvantage: the analysis of chapter 3 confirms this disadvantage, some of which was explicable in terms of lower academic standards.

The study confirmed the suspicion of several applicants that relatively late applicants were at a disadvantage (chapters 2 and 3). They pointed out that late application is not always the fault of the applicant but may result from other circumstances, including delay on the part of the author of the confidential report. They proposed that if the chance of serious consideration diminishes towards the closing date medical schools should indicate that fact in their prospectuses. Some suggested that applications to read medicine should be subject to the same early closing date applied to Oxbridge applications.

Only two applicants voiced fears of discrimination against women (for which there was no evidence) and two others thought that if there was such discrimination it was justified on economic grounds. One or two interpreted the request on the UCCA form for details of the next of kin's occupation (normally the father's) as an indication of undervaluation of working mothers.

One applicant was concerned about the possibility of racial discrimination. One other poorly reported study has suggested that there might be discrimination against racial minorities in medical schools (Veitch, 1984). In the St. Mary's study the only information concerning ethnic group came from the photographs that interviewees brought with them, which were attached to the UCCA form, and were assessed after the event by myself. Of 326 UK nationals who attended for interview, only 12 (3.7%) were broadly classified as 'non-white'. 72.6% of white and 41.7% of non-white interviewees were eventually accepted at a medical school (Chi-squared with Yates' correction = 4.02, 1 df, $p<0.05$); four of these five non-white acceptances were at St. Mary's, and the other at Oxbridge. The difference between White and non-white interviewees remained significant when differences in application pattern had been taken into

account (p=.014). Non-white applicants had significantly fewer 0-levels, lower 0-level mean grades and lower A-level mean grades than White applicants, and when these differences were taken into account the significant difference between ethnic groups disappeared. Nevertheless the mean A-level grade of non-whites was 3.12 (i.e. above C) which is only half a grade or so below that of Whites (mean 3.74). It would seem therefore that the use of high entrance requirements may discriminate against some minority groups, whose lower standard may indicate social and educational deprivation rather than lesser ability.

Finally, tiresome though questionnaires may be, one respondent was kind enough to comment "It's been quite fun filling in this questionnaire; sort of relaxing and as though you are interested in me..."; then, presumably referring to the previous year, he continued "too bad that I did not get accepted by St. Mary's".

Conclusions and proposals for change.

Academic and non academic criteria. There are currently so many talented people seeking admission to medical school that it seems inevitable that all things being equal, widely talented individuals who can also achieve high academic standard at 'A' level are the ones who gain admission. There is no evidence that in general those who are rejected would be more suitable or more deserving of an opportunity to become doctors than those accepted. It is, however, essential for the system to have sufficient flexibility to enable unusual but promising individuals to get in, especially those who have practical skills, or who are from minority racial groups, who are disabled, or who have suffered social or educational deprivation.

Ideally 'O' level achievement should not be used to predict A-level performance or be taken as more than an indication of general education. The only remedy is to insist that applicants should take A-level before applying for entry to medical school. If it were possible for all entrants to find employment during a year off between school and university then such an arrangement would be strongly advocated, since it would at one and the same time remove speculation about 'A' level grades and ensure greater maturity.

While it would clearly be advantageous for the purpose of comparison of standards for all university entrants (not just those wishing to read medicine) to take the one 'A' level examination there are many reasons why the different examining boards continue to exist. On the other hand it may be even more difficult to compare levels of achievement in different A-level subjects than to compare grades in examinations in the same subject set by different boards. A separate examination for entry to medicine would overcome these difficulties but would itself be undesirable in setting medicine apart from other science subjects.

The only remedy is that selection should take into account as many attributes as possible, the academic target set being sufficient only to ensure no academic difficulty with the medical course rather than being used as a competitive discriminant. The former is the policy at St. Mary's and at several other schools.

The timing of application. It seems clear that the sequential system of receipt of applications over 3 months (with a dribble of late applications for several months) prejudices the chances of later applicants. It is therefore recommended that applications to read medicine in the UK should be submitted before 15th October, as are

Oxbridge applications. Furthermore it would be desirable if until that date the applications were stored at UCCA and then sent <u>en masse</u> to each medical school at the same time, perhaps in alphabetical order. The slightly later start to the selection 'season' should not unduly affect medical schools; and it would convert the present rather unseemly scramble for 'good' candidates into one in which all the competitors at least started at the same time.

<u>Background</u> The reasons for the children of medical parents having a marginal advantage over those from non-medical families have not been examined. It may simply represent the advantage of knowing more about the course and career, may indicate the advantage of personal contacts, or it may be the consequence of the long-established practice of giving interviews to the children of graduates and/or employees of a school as a courtesy, a courtesy extended at many other university faculties and colleges. On the other hand this courtesy is still extended at St. Mary's and in the year surveyed did not result in a preferential admission rate. It is, however, clear that overwhelmingly the major cause of a large number of doctors' children in medical schools is the fact that they comprise a large proportion of the applicants.

The advantage conferred by private sector education, apart from any effect on 'A' level achievement, may stem, as some applicants suggested, from better career guidance. The remedy lies in more available general information about the course and career of medicine and good career counselling at all schools.

<u>Headmaster's Report.</u> Candidates are concerned that headmaster's reports are unreliable, perhaps due to lack of individual knowledge; medical

schools worry that the headmaster's reports may exaggerate the quality of the applicants in order to help their chances of admission. Knowledge of such inaccuracies is difficult for the individual Admissions Tutor to acquire. One possible solution would be for headmasters to complete a short pro-forma on each applicant, indicating the quality of the candidate <u>relative to other candidates for medicine,</u> on a number of rating scales (mathematical, linguistic and scientific ability, cultural, sporting and community activity, commitment to medicine, empathy, etc.). If the results of such proformas were stored nationally in computer-readable form then after a few years it would be apparent which headmasters were making a good spread of judgements, and which were saying that all of their geese were swans. Medical schools could be informed of this information (as perhaps could headmasters). Clearly such a scheme would need to be administered by the UCCA, at the time of initial application.

<u>Interviewing.</u> From the survey it would seem that an important role of interviews is to emphasise the non-Academic abilities of applicants; there is no difference in academic standards of entrants to interviewing and non-interviewing schools. Nevertheless, whatever the arguments for and against interview as a useful means of selection (and St. Mary's does interview), many of the applicants have very clearly expressed their view in favour of the interview as a part of natural justice in representing their own case for selection. This in itself is sufficient reason for including an interview as part of the selection process. An effort should also be made to increase the discriminant value of interviews, although studies of this are difficult due to the peculiarly intractable problem of discriminating 'good' from 'bad' doctors at some far distant time in the future. Selection with or without interview would perhaps be

felt to be fairer if the limited quantity of information available on the UCCA form and in a 15 minute interview were augmented by asking all applicants to complete some form of questionnaire, either multiple-choice in type, as were Q1 and Q2 of the St. Mary's survey, or perhaps with open-ended or semi-structured questions, or essays; thus candidates could be asked to give a much broader picture of themselves. The logistics of such a system would, however, be formidable. In order to avoid abuse, the questionnaire could be accompanied by a signed certificate from the headmaster, or other figure of authority, stating that the questionnaire was completed by the applicant himself, and that to the best of the referee's knowledge, the answers were true. Naturally the applicant could also be questioned directly about its contents at interview itself.

Mature applicants. Many problems of assessing motivation and true intellectual ability would be resolved if a greater proportion of entrants were mature, either applying after a first degree course (in a manner akin to US graduate school), or after suitable work experience without formal higher education. By encouraging a substantial delay between leaving school and entering medical school, self-selection would be allowed to take the place of selection. A sine qua non of regarding medical school as a graduate school is that Local Education Authority grants should be available for the whole 5 or 6 years of a second (medical) degree course, and not just for three years as at present, and that is strongly recommended as a reform.

Order of preference. The only way of resolving the difficulty in making a rational order of preference, and dismissing fears of a distortion of

opportunity by the chance strategy of first preference, is to insist that applications to read medicine should be listed in alphabetical or UCCA numerical order. It would still be open to the candidates to ensure that the confidential report revealed any strong preference, or to state their preference at interview. This would be the simplest change to implement of those proposed and would on the evidence of the comments in the survey be met with wide approval by applicants; admission deans would probably not be so pleased because the change would remove one useful aid to short-listing.

<u>Figure </u>7-1: Shows the mean A-level grade of applicants as a function of their mean 0-level grade.

Table 7-1: Major comments made by applicants completing Ql

Total number of applicants commenting on selection procedure		623
Comments on interviewing		206
Concern on excessive academic emphasis		205
Concern at pressure to state order of preference		171
Concern at possible bias		102
— in favour of doctors' relatives	73	
— in favour of social and school background	29	
Satisfaction within practical limitations		45
Need for more **information** on course, career and individual medical schools		41
Need for better opportunity for conducted visits to medical schools		35
Need to see greater emphasis given to practical experience and practical ability		17
Concern at excessive reliance on '0' level results		11

Table 7-2: Characteristics proposed by applicants as relevant and important to intending doctors

Ability to listen

Ability to communicate widely

Awareness

Character

Commitment

Commonsense

Compassion

Concentration

Correct attitude

Dedication

Determination

Enthusiasm

Inquisitiveness

Keen observation

Motivation

Perseverance

Personality

Response to challenge

Self discipline

Stability

<u>Part II: Attitudes and Culture.</u>

"Universities are not intended to teach the knowledge required to fit men for some special mode of gaining their livelihood. Their object is not to make skilful lawyers or physicians or engineers, but capable and cultivated human beings"

     John Stuart Mill, in Cavenagh (1931; p.133).

"A medical man likes to make psychological observations, and sometimes in the pursuit of such studies is too easily tempted ..."

       George Eliot, <u>Middlemarch,</u> Chapter 30.

"Thou shalt not do as the dean pleases,
Thou shalt not write thy doctor's thesis
        On education,
  ...
Thou shalt not answer questionnaires
    ... Thou shalt not sit
With statisticians nor commit
       A social science ..."

                -     W.H. Auden
           (Under Which Lyre, 1946)

"Chapter 1.

1. Ethics is a department of the Science or Study of Practice.

2. It is the study of what ought to be, so far as this depends upon the voluntary action of individuals.

3. In deciding what they ought to do, men naturally proceed on different principles, and by different methods."

Henry Sidgwick, The Methods of Ethics,

6th edition, 1901.

<u>Summary.</u>

    The responses of 1325 medical and prospective medical students in the Birmingham, Cambridge and St. Mary's studies were assessed on a set of 112 attitude questions concerning ethical, moral, social and political attitudes. Factor analysis of the responses suggested the existence of eight independent factors, which are dominated by two super-ordinate factors, which have been labelled 'Libertarianism' and 'Tough-mindedness'. The test-retest correlations over periods of from 1 to 4 years are described.

The nature of ethical problems in medicine is such that very often it is impossible to attain a universal agreement as to right or wrong. Nevertheless it is inevitable that many practitioners will hold views on such matters as a part of their day-to-day working; and indeed Bradley (1983) has suggested that "every consultation has an ethical component". From a psychological viewpoint the important questions concern the origins of such attitudes, the factors determining change in them, and their inter-relation with other attitudes. Whilst in principle it is possible that each single ethical problem is considered in vacuo (ethical atomism), in practice it is the case that large numbers of ethical attitudes tend to cluster together, along with political, moral, social and religious values. Often these associations between attitudes are either obscure in logical terms, or even frankly inconsistent. Nevertheless, that they occur must be taken into account when considering ethical questions in general.

Previous studies of large numbers of attitudes have suggested that the answers to a multitude of attitude questions can be reduced to a relatively small number of dimensions. Thus Eysenck (1954) suggested that there were two major dimensions in politico-social attitudes; "Radicalism - Conservatism" and "Tough-mindedness - tender-mindedness", the latter dimension being named after William James' (1907) description of these philosophical positions. Eysenck noted that an alternative designation of Tough-mindedness would be "Authoritarianism" (after Adorno et al, 1950), and he also pointed out that "Humanitarianism" can be considered as the conjunction of Radicalism and Tendermindedness, and "Religionism" can be considered as the conjunction of Conservatism and Tendermindedness. Arblaster (1984; p.77) has pointed out that political systems per se can be characterised in a two-dimensional system of 'Liberalism vs Totalitarianism' and 'Authoritarianism vs Democracy',

which can be construed as corresponding to Radicalism-Conservatism and Tough-mindedness-Tender-mindedness respectively.

Eysenck (1975) extended his earlier analysis, arguing that on theoretical grounds it might be necessary to split "radicalism - conservatism" into two independent factors, "general conservative-radical ideology" and "socio-economic conservatism v. radicalism", and he produced a factor analysis demonstrating that result. However he also suggested that as many as ten factors might be interpretable, and he gives names to these factors: "Permissiveness, Socialism, Racism, Laissez-faire, Pacifism, Capitalism, Religion, Reactionary Individualism, Human Nature, and Libertarianism".

Himmelweit et al (1981) examined a set of political attitudes and concluded that a five-factor description was adequate, with their being two "supra-families" of attitudes. Although they did not actually name these clusters they say that those "within the first major family ... concern class or economic issues", and those "within the second supra-family ... concern law and order, the need for stricter laws and increase in the powers of the police, etc., views on capital punishment and the law on homosexuality as well as on immigration" (p.140). These two supra-families would therefore seem to be close to Eysenck's two major attitudinal dimensions.

The present chapter will ask how the answers to ethical questions inter-relate; that is, What is the structure of the medical students' ethical attitudes? A necessary concomitant of describing the structure of attitudes is that the questions themselves are presented extensively. In other chapters the development of attitudes, and their correlation with background and other factors will be considered.

It might be felt that the mere description of attitudes to ethical problems is of little use in actually resolving those problems, or determining some sort of 'correct action' for them (following the argument of John Stuart Mill, that one cannot derive what <u>ought </u>to be the case from a consideration of what <u>is</u> the case). Is so then studies of attitudes, such as this (and others of which Dunna and Shaw, 1983 and Young, 1984, will serve as examples) would be 'merely' of sociological interest. That view has however been disputed by Downie (1984) who has argued as a professional moral philosopher that the attitudes of practitioners (and indeed of the rest of the general public) are of interest and importance in determining moral standards since those attitudes in part help to determine the ethical climate for the rest of the profession and of the public; the system is therefore strongly interactionist in that the consensus ethical view of the whole profession itself helps to determine the ethics of individual members of the profession, who of course in a strict sense constitute the profession.

Method

A pilot survey was carried out in the medical school of the University of Birmingham during 1974 (McManus, Daniels, and Cruickshank, unpublished). That questionnaire contained 66 questions on ethical, moral and political attitudes, and was completed by 330 students. All the questions were original with the sole exception of eight questions devised by Dean (1972) concerning attitudes towards General Practice. On the basis of the pilot study a more extensive questionnaire was developed containing 112 separate ethical questions (including those of Dean, 1972), each of which could be answered on a four-point Likert-type scale ("Definitely Yes", "Probably Yes", "Probably No", and "Definitely No")

(see e.g. Walton, 1967). These ethical questions were included in three separate studies:

1. The Birmingham study. In total 1008 questionnaires were completed by 817 students, of whom 191 completed the questionnaire on two separate occasions, separated by intervals of from 1 to 4 years. Since the purposes of the present study are primarily to examine the <u>structure</u> of attitudes, all 1008 responses are included in the analysis.

2. The Cambridge Study. 164 questionnaires were completed, which represents a response rate of 58.6%.

3. The St. Mary's study. The questionnaire was completed by all but one of the applicants interviewed at the school during the winter of 1980-1981, and by 7 of the 13 applicants given a place without interview that year. 344 questionnaires were completed in all.

Statistical analysis was by means of the Statistical Package for the Social Sciences (SPSS) (Nie et al, 1975; Hull and Nie, 1981).

<u>Results.</u>

Overall 1516 questionnaires were completed by 1325 students. Not all students answered all questions and hence sometimes totals differ from these values. Three students answered none of the ethical questions, and one answered only four of the ethical questions. For the remaining 1512 questionnaires, a mean of 102.7 questions was answered (median = 106.7; SD = 11.95; 5th percentile = 79; range = 23 to 112).

Two separate types of question can be asked of these data. The first concerns means, and takes the form, "How many people agreed or disagreed with a particular view-point?". Such questions are inherently unsatisfactory since they are heavily dependent upon the idiosyncrasies of the particular wording of the questions, a slight change often producing substantial changes in response pattern. Little emphasis should therefore be put upon absolute proportions of responses. Nevertheless relative judgements may still be made, concerning differences between groups of individuals who agree or disagree with particular statements. The second type of question that can be asked considers variances, covariances or correlations (all of which are essentially independent of means) and take the form, "Do people who answer Yes on one question also tend to answer Yes on another particular question?". Such questions are rather more useful as an analytical starting point. In particular they allow the potential, via the statistical techniques of factor analysis, of reducing the apparently inchoate results of 112 separate questions to a more limited and manageable set of values which encapsulate the essence of the responses of an individual. To take an extreme case, if the responses to two questions correlate perfectly then either alone tells all there is to know about the other. The problem is therefore to determine the optimum number of dimensions for describing the answers to the 112 questions.

A principal factor analysis (option PA2 of SPSS) was carried out on the 100 x 100 Pearsonian correlation matrix generated from the first 100 of the 112 questions (this circumvention was necessary since for computational reasons SPSS limits analyses to 100 variables). Correlation matrices were generated using 'pair-wise' deletion of missing values. A similar analysis was then carried out for the last 100 of the 112 questions. Examination of the eigen-values for these analyses by

means of the 'scree-slope' technique (Cattell, 1966) suggested that a total of eight independent factors were found in the correlation matrices. The 100 questions with the highest communalities on the first eight factors in the two analyses together were then subjected to further analysis. It was clear from the scree-slope analysis (figure 8-1) that the first two of these factors were of much greater importance than the other six. Two separate principal factor analyses were therefore carried out; the first looked for eight independent factors, which will be called factors 1 to 8; the second looked for just two superordinate factors, which will be called factors I and II. After extraction of factors a Varimax rotation was carried out to simplify the interpretation of factors, and a set of scores was computed for each subject on the ten derived factors (by the FACSCORE option, up to half of the variables being permitted to be missing, missing values being replaced by population means). Each score was standardised so that across all questionnaires analysed a mean score of zero and a variance of unity was produced. Together factors 1 to 8 account for 30.7% of the total variance in the responses to the questions, and factors I and II accounted for 48.1% of the common variance in the eight main factors.

Tables 8-1 to 8-8 summarise factors 1 to 8. For each factor is shown the questions which have absolute loadings of greater than .2 on that factor, a loading being the correlation of that item with the underlying factor dimension. Positive loadings indicate that high positive scorers on the factor are more likely to answer Yes to that question, and negative loadings that high positive scorers are more likely to answer No. Not all questions load on a single factor, and where this is the case the other 'significant' loadings (i.e. absolute loading greater than 0.2) have also been indicated. A few questions, which are indicated by an asterisk, and which did not come within the top

100 communalities, have been included despite having loadings of less than 0.2, since otherwise these variables would have been omitted completely from the tables; they have been placed in the table(s) on which they have the largest loading. Tables 8-1 to 8-8 also show the number of students who answered a particular question, and the percentages who made each of the four possible responses. It should be remembered that two variables having similar loadings on a factor need not have similar distributions of answers in each of the response categories, since one is a function of means and the other of correlations. The numbers adjacent to questions indicate their position on the original questionnaire, and hence the order in which they were presented.

Table 8-9 shows the relationships between the eight main factors and the two superordinate factors. It is clear that factors 1 to 5 share substantial variance with factors I and II, each of the five showing slightly different patterns of correlation. However with the possible exception of factor 1, all five factors contain a substantial proportion of variance which is unique to themselves, and unaccounted for by factors I and II. If an oblique factor structure were contemplated then factors 1 and 4 would be related, as would factors 2 and 5, with factor 3 being related to each of the two clusterings; in other words, questions within a cluster could be construed as measuring different aspects of the same thing. Factors 6,7 and 8 show no relationship with factors I and II and thus must stand in their own right as assessing truly independent sets of attitudes.

The most difficult **aspect of** factor analytic studies is 'reification' - the identification and naming of factors. In a strictly mathematical sense absolute identification is impossible since any arbitrary rotation may be applied to the factors and yet leave their relative positions unchanged. Nevertheless the pragmatic advantages of naming are enormous, since it allows conceptual identification and analysis, despite the inevitable idiosyncrasies of interpretation which might arise. In practice it is often difficult to find names which adequately describe a complex set of attitudes, and usually it is necessary to concentrate only on those items with high loadings in order to name a factor.

Factors 1 and 4 are clearly related in that both load on factor I. Factor 1 seems to be primarily concerned with the issues of abortion, infanticide, euthanasia, suicide and contraception. Factor 4 is dominated by the problems of personal drug usage, homosexual freedom and the control of pornography. Both are concerned with the freedom of the individual, and therefore it is intended to call factor 4 "Personal libertarianism" and factor 1 "Vital libertarianism" (since it is primarily concerned with the relationship between the individual and questions of life and death).

Factors 2 and 5 are related in that each loads heavily on factor II. Factor 5 is primarily concerned with economic matters, being in favour of private practice, high wage differentials, and commercial competition, and against high taxation and wealth re-distribution; it is therefore called "economic conservatism" (although "economic tough-mindedness" or even simply "Capitalism" (following Eysenck) would be reasonable alternatives). Factor 2 is primarily concerned with the relationships between individual problems and society, and positive scores indicate a

tough response e.g. in favour of capital punishment and harsh treatment of criminals, compulsion in dealing with genetic problems and contraception, and a lack of sympathy for sociological and psychological problems; it is therefore called "Social Tough-mindedness".

Factor 3 loads on both factor I (positively) and II (negatively). Scrutiny of the items in table 8-3 suggests that the items are fairly heterogenous, and the best simple description of this item is probably "Liberalism" (i.e. libertarian tendermindedness, or humanitarianism as Eysenck (1954) suggested).

Factors I and II may also be named. The emphasis on liberty in factors 1, 3 and 4 suggests that factor I is best labelled "Libertarianism". The emphasis upon firmness in factors 2 and 5 (and on compassion in the negative loading on factor 4) suggests that factor II is best labelled "Tough-mindedness".

Factor 6 is the most difficult of the factors to name. It seems to be primarily concerned with medical problems, and since a high score seem to indicate a concern with controlling either the practice of medicine itself, or its application to society, the best, albeit somewhat unsatisfactory, name seems to be "Medical control".

Factor 7 is concerned only with Sex Education, and will be so called. High scorers are in favour of increased sex education.

Factor 8 consists almost entirely of questions from Dean's (1972) questionnaire on attitudes to general practice, and can simply be called "General Practice". High scores indicate sympathy with the needs of general practice.

Since a number of Birmingham students were tested on two occasions, over intervals of one to four years, it is possible to gain some idea of the test-retest stability of the attitudinal dimensions; the correlations are shown in table 8-10. On most items the correlations are sufficiently high to mean that the scales are empirically useful. It should be remembered that in part a low correlation may reflect a genuine change in attitudes rather than simple unreliability of the instrument, particularly given that on some scales there are changes in the mean values over the intervals. This is particularly the case with factors 1, 4, 8 and I, in which the test-retest correlation declines linearly with the interval between testing, suggesting that the factor being assessed is more of a 'state' than a 'trait' measure (i.e. it is not a fixed aspect of personality but is changing as the person develops). The question of change in these scores will be developed more fully in chapters 9 and 13.

Discussion.

In this chapter has been described the results of administering a questionnaire on ethical, social, and political attitudes to over 1300 medical students, and the inter-relations of the responses to those questions, deriving eight factors and two super-factors which contain a high proportion of the total variance in the responses. It must be stressed however that in extracting these factors it is not implied that no other dimensions are important, only that such other factors are sufficiently isolated within the context of the questionnaire to make them indistinguishable from background variation. A more extensive study might reveal them.

The eight separate attitudinal dimensions may be summarised:-

1. <u>Vital Libertarianism,</u> This factor concerns the relationship between individuals and matters of life and death. High scorers are more sympathetic to abortion, infanticide, euthanasia, suicide and contraception.

2. <u>Social Tough-mindedness.</u> This factor is concerned with the relationship between the problems of individuals and the response of society; high scorers are in favour of capital punishment, harsh treatment of criminals, compulsion in dealing with genetic problems and contraception, and they show a lack of sympathy for sociological and psychological problems.

3. <u>Liberalism.</u> This factor includes a miscellaneous range of general items, although it excludes many which would come under the conventional heading of liberalism, but which here appear in other factors (such as 1, 2, 4 and 5). High scorers feel that doctors sometimes impose ethical and political views on patients, that science has dehumanised medicine, that politics is relevant to medicine, that a detailed knowledge of anatomy is not essential for all doctors, that environment is more important than genetics in determining intelligence, that not all forms of advertising are acceptable, and that racism might explain the lack of promotion of doctors of Asian origin. In some sense this factor might be labelled 'Humanitarianism'.

4. <u>Personal libertarianism.</u> This factor is primarily concerned with individual freedom, and high scorers are sympathetic to the problems of homosexuals, to personal drug usage, and the availability of pornography.

5. <u>Economic conservatism.</u> This factor primarily concerns economic matters, high scorers being in favour of private medical practice, larger wage differentials and commercial competition, and are opposed to high taxation and wealth re-distribution.

6. <u>Medical control.</u> This factor is primarily concerned with the control of medicine and its applications. High scorers are in favour of stricter control of barbiturate prescription, and of ECT, would welcome more information about medicine in the newspapers, are in favour of patients being given more information about their illnesses, and are sympathetic to sociological and psychological aspects of medicine.

7. <u>Sex education.</u> High scorers are in favour of earlier sex education.

8. <u>General practice.</u> High scorers are sympathetic to the needs of general practice.

In addition, two orthogonal super-ordinate factors were derived: I, labelled as 'Libertarianism', correlated positively with factors 1, 3 and 4; II, labelled as 'Tough-mindedness' correlated positively with factors 2 and 5 and negatively with factor 3.

It must finally be emphasised that the present approach does not say that there is any necessary logical, philosophical, ethical or causal link between the various items in each of the factors, but rather it merely says that these items are psychologically related in so far as knowing a person's attitude on one item will allow a better prediction of the other items than chance would suggest.

Figure 8-1: Shows the eigen-values of the first 35 factors plotted against the factor-number. A beat-fitting scree-line has been plotted by eye.
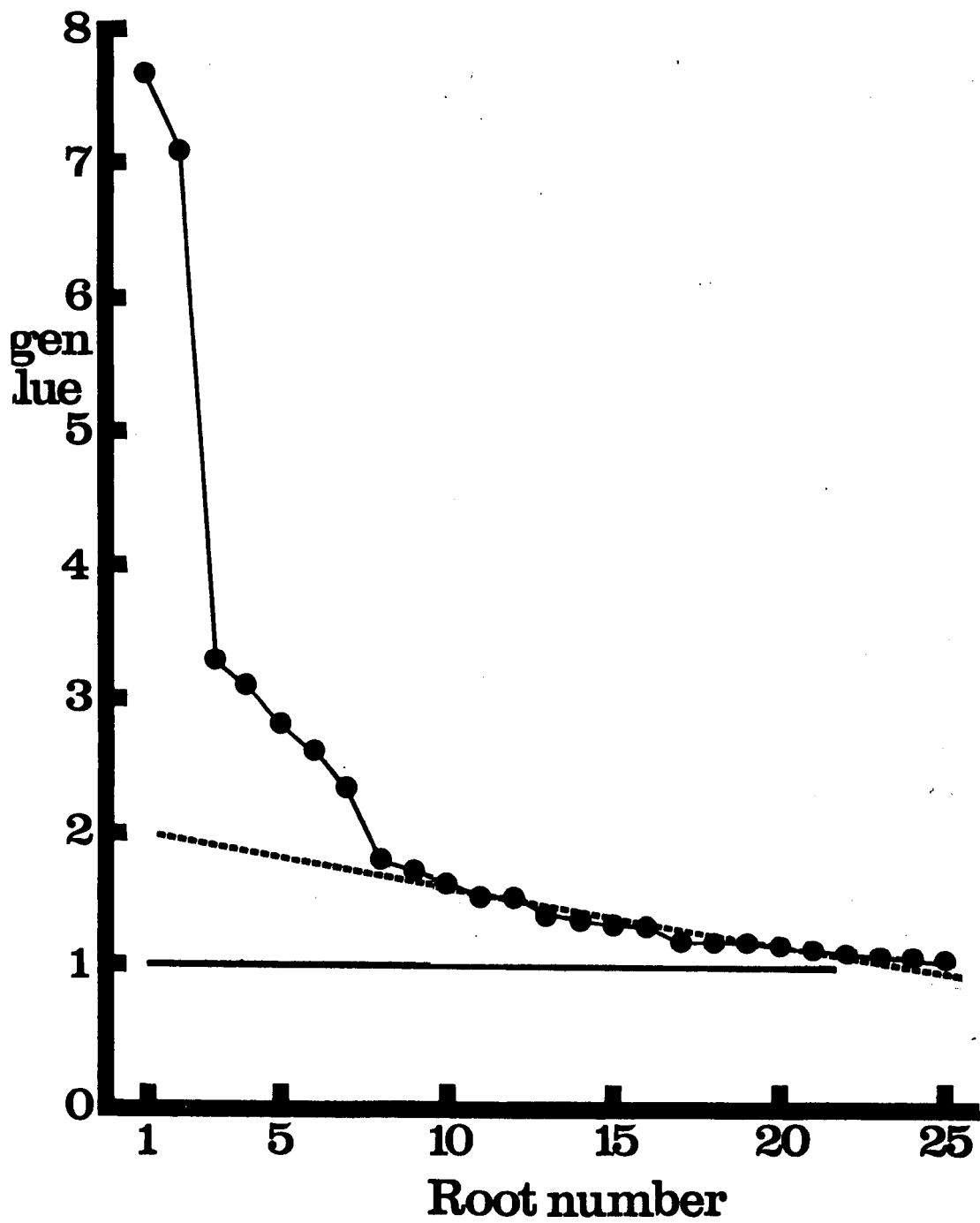
(...) the number of respondents answering that question, and the
percentages giving each of the four possible responses.

32.

In which of the following situations in which an abortion has been requested would you think that it should be performed?

Item	factor 1 loading	Other factor	loading	factor	loading	N	Def Yes	Prob Yes	Prob No	Daf No
v. A 25-year old woman who has been raped.	.79					1440	63.5	25.6	7.2	3.8
ii. A woman known to be definitely bearing a fetus with spina bifida.	.78					1436	60.5	28.0	6.3	5.2
iv. A 13-year old girl who has been raped.	.77					1450	78.8	17.6	2.4	3.2
vi. An unmarried women who is pregnant as a result of failed contraception.	.76	4	.24			1440	28.3	34.3	24.2	13.2
iii. A woman who might have had German Measles earlier in pregnancy.	.72					1387	32.1	40.9	19.2	7.8
viii. A 38-year old mother of six.	.72					1422	31.6	29.9	25.0	13.5
vii. A woman who has failed to use any form of contraception.	.64	4	.24			1432	14.3	25.3	34.1	26.3
i. A woman with congenital heart disease who is unlikely to survive the rigours of childbirth	.84					1460	77.1	19.0	1.8	2.1
Should immediate infanticide be permissible for children born with gross multiple abnormalities?	.47	2	.36			1388	21.9	34.6	23.2	20.3
Should euthanasia be possible if a patient has previously agreed to it whilst in full possession of his faculties?	.42	6	.38	4	.27	1406	24.7	43.2	19.2	12.9
Does the individual have the right to commit suicide?	.32	4	.30	3	.22	1409	43.9	34.0	11.7	10.4
Should euthanasia be possible if a patient has previously made no statement as to his wishes?	.32	1	.30			1404	3.8	18.1	34.3	43.7
Should the following be provided or allowed under the NHS? iii. Contraception	.30	4	.22	3	.20	1480	72.2	22.0	3.3	2.5
Do Jehovah's Witnesses have the right to expect that their children will be treated in accord with their own wishes?	-.13					1371	8.2	19.7	36.9	37.2

(...) the number of respondents answer in that question, and the percentages giving each of the four possible responses.

	factor 2 loading	factor	loading	factor	loading	N	Def Yes	Prob Yes	Prob No	Def No
72. Do you think that capital punishment should be brought back:										
ii. for murder of police or prison officers?	.60	5	.44			1434	19.2	22.9	22.2	35.8
i. for all murders?	.59	5	.27			1440	10.3	13.1	25.3	51.3
iii. for acts of terrorism?	.55	5	.44			1438	30.6	22.6	17.5	29.3
98. Is compulsion preferable to education in decreasing birth rates in the developing world?	.40					1377	3.7	14.5	45.8	36.1
21. Was the introduction of the NHS a retrograde step?	.37					1417	1.4	4.9	30.9	62.7
46. Should immediate infanticide be permissible for children born with gross multiple abnormalities?	.36					1386	21.9	34.8	23.2	20.9
48. Should euthanasia be possible even if a patient has previously made no statement as to his wishes?	.32	1	.30			1404	3.8	18.1	34.3	43.7
40. Should all known carriers of genetic disease be sterilised?	.31	3	-.29			1425	2.5	12.1	38.8	48.5
71. Should mentally ill criminals be treated in prisons rather than in hospitals?	.30					1393	3.8	16.8	47.0	32.4
73. Are people motivated to work only by financial reward?	.28					1482	1.8	18.3	38.3	43.9
24. Is psychosurgery Justified on convicted criminals?	.27					1360	3.1	17.8	40.4	38.8
84. Is the purpose of prison to punish rather than to reform or rehabilitate?	.25					1374	12.7	38.9	31.6	18.8
91. Is poverty in this country primarily a result of personal inadequacy?	.23	5			.32	1319	3.4	25.9	47.2	23.5
80. Do you think only pre-clinical medicine should be taught which is directly relevant to clinical medicine?	.21					1434	6.3	16.1	49.5	28.0
83. Would severe statutory prison sentences be the best means of deterring potential rapists?	.19	3	-.18			1415	11.2	28.7	48.8	13.2
'78 Are entrance charges for museums and art galleries desirable?	.16	4	-.18			1455	10.8	27.8	31.9	29.6
'109 Is it of any consequence if racial differences in intelligence are demonstrated?	.12	5	.14			1370	15.0	28.6	35.1	21.3

	factor 2 loading	factor loading		factor loading		N	Def Yes	Prob Yes	Prob No	Def No
	-.15									
*38 Do Jehovah's Witnesses have the right to expect a dangerous operation without the administration of blood?						1380	12.6	24.3	35.4	27.7
45. Would you welcome more articles about medicine in the newspapers if the articles were responsible and accurate?	-.21	8	.38			1491	83.6	27.9	6.8	1.9
111. Is co-education desirable in secondary schools?	-.21	3	.20			1409	51.1	39.7	8.9	2.3
107. Should more consideration be given to social and psychological factors in disease?	-.22	8	.34	3	.40	1419	28.8	83.4	7.3	0.6
52. Do you think the GP will play a vital role in the delivery of medical care in the future?	-.22	3	.25	8	-.31	1428	48.2	43.8	7.2	0.7
34. A doctor has a patient who refuses the first-line treatment offered to him. Is it the doctor's duty to offer an alternative form of treatment?	-.26					1465	37.4	51.3	9.4	2.0
75. Should the distribution of wealth in this country be made more equal?	-.26	5	-.58	3	.21	1389	18.1	31.7	36.9	15.3
103 Can sociologists provide insights into medical practice?	-.34	8	.29	5	-.23	1254	15.4	80.2	20.6	3.8
90 Has sociology a valid place in a university?	-.35	6	.24	5	-.24	1326	28.7	52.5	13.5	5.4
102 Should the state provide care and accommodation for the elderly?	-.37					1481	70.8	26.5	2.4	0.3
70 Should insanity be regarded as a mitigating factor in criminal proceedings?	-.40					1365	26.3	54.9	14.9	3.8
80 Should one make all possible efforts to save the life of a person who has taken his tenth overdose in three months and is not psychiatrically ill?	-.40					1447	56.1	24.3	15.5	4.0
79 Should one make all possible efforts to save the life of a first-time overdose?	-.43					1493	88.5'	10.7	0.5	0.3

	factor 3 Loading	----other loadings----				N	Def Yes	Prob Yes	Prob No	Def No
		factor	loading	factor	loading					
66. Do you think that consultants might often put over their own political views under the guize of medical opinion?	.50					1297	15.3	48.7	33.5	2.5
50. Do you think that there is a tendency for Asian doctors in the NHS to not be given promotion because of their race?	.46					1192	9.2	40.0	43.1	7.6
104. Do doctors sometimes impose their own moral pre-conceptions upon their patients?	.45					1427	29.5	65.0	5.2	0.4
106. Have scientific advances in medicine Led to a dehumanised attitude to patients?	.40					1429	9.3	43.4	40.0	7.3
25. Do GPs prescribe psychoactive agents too commonly as a panacea for all ills?	.40					1259	22.6	58.9	16.8	1.8
23. The Inverse Care Law says that in this country the areas with the greatest medical need have the least medical resources: can this be true?	.37					1334	19.0	53.5	24.8	2.7
44. Is politics relevant to medicine?	.35					1420	25.8	31.1	17.2	26.0
42. Is it possible that civilisation will cause more disease than it cures?	.31					1392	9.1	45.4	38.5	7.0
55. Do you think the GP should play a larger role in the teaching of the medical student?	.31	8	-.38			1403	38.6	48.8	11.4	1.3
41. Is poverty still a major cause of disease in this country?	.30					1417	10.8	28.9	46.9	13.4
82. Should teaching of undergraduates at peripheral hospitals be encouraged?	.30					1340	29.8	54.9	14.7	0.7
65. Should students be encouraged to question views expressed by consultants?	.29	6	.22			1450	44.7	51.5	3.6	0.2
26. Should the following be provided or allowed under the NHS? iv. Providing heroin for addicts	.28	4	.23			1441	10.2	27.7	29.6	32.5
105. Is there much in good medical diagnosis that cannot be written down in books?	.27					1358	38.2	53.5	8.3	1.0
26. Should the following be provided or allowed under the NHS? ii. Cosmetic surgery	.26					1452	18.5	38.2	29.3	16.0
67. Do you think that the GP tends to develop more interesting relationships with his patients than does the hospital consultant?	.26					1430	35.7	52.5	11.0	0.8
62. Do you think the GP will play a vital role in the delivery of medical care in the future?	.25	2	-.22	8	-.31	1428	48.2	43.8	7.2	0.7
12. Should greater status be given to ability and experience rather than to educational qualifications?	.25	6	.23			1378	30.9	55.5	12.4	1.2

	loading	factorloading		factorloading		N	Oaf Yes	Prob Yes	Prob No	Def No
95. Should cannabis be legalised in this country?	.24	4	.40			1422	9.4	19.4	33.1	38.2
64. Is practical experience more important than academic knowledge in the education of medical students?	.24					1354	20.7	56.8	21.0	1.7
26. Should the following be provided or allowed under the NHS?										
i) Trans-sexual surgery	.23	4	.30			1448	9.8	28.6	30.6	31.2
56. Do you think that the financial reward of the GP is satisfactory relative to other branches of medicine?	.22	8	-.24			1213	19.7	53.0	21.4	5.9
51. Do you think it is more difficult for the GP than for the hospital consultant to keep up to date in medicine?	.22					1412	21.0	58.4	19.3	3.3
89. Does the individual have the right to commit suicide?	.22	1	.32	4	.30	1409	43.9	34.0	11.7	10.4
75. Should the distribution of wealth in this country be made more equal?	.21	5	-.58	2	-.26	1389	18.1	31.7	38.9	15.3
77. Should there be encouragement of profit-sharing schemes for employees?	.21	6	.23			1408	38.3	58.1	4.8	1.1
107. Should more consideration be given to social and psychological factors in disease?	.21	6	.34	2	-.22	1419	28.8	63.4	7.3	0.8
111. Is co-education desirable in schools?	.20	2	-.21			1409	51.1	39.7	8.9	2.3
26. Should the following be provided or allowed under the NHS?										
iii) Contraception	.20	1	.30	4	.22	1480	72.2	22.0	3.3	2.5
83.* Does repetition provide a useful way of emphasising important points in a curriculum?	-.14					1484	31.9	55.5	9.8	2.8
98. Do you think that genetics is far more important than environment in determining intelligence?	-.18					1396	8.5	29.8	48.1	15.8
83. Would severe statutory prison sentences be the best means of deterring potential rapists?	-.18	2	.19			1415	11.2	26.7	48.8	13.2
99. Should the consultant be the only person responsible for making decisions about patient management?	-.19	8	.19			1414	2.4	10.8	52.3	34.7
81. Is a detailed knowledge of anatomy essential for all doctors?	-.21					1448	43.4	36.5	17.1	3.0
88. Do you consider that all forms of advertising are acceptable?	-.23					1482	3.7	18.2	41.9	38.2
108. Is it reasonable to object to the use of ECT simply because its mode of action is unknown?	-.24	6	.31			1280	8.0	28.2	45.0	18.8
40. Should all known carriers of genetic disease be sterilised?	-.29	2	.31			1425	2.5	12.1	38.8	48.5
39. Should amniocentesis be compulsory for all pregnant woman?	-. 43	8	.35			1046	7.4	22.7	32.4	37.5

(...) the number of respondents answering that question, and the
percentages giving each of the four possible responses.

	factor 4 loading	factor	loading	factor	loading	N	Def Yea	Prob Yea	Prob No	Def No
95. Should cannabis be legalised in this country?	.40	3	.24			1422	9.4	19.4	33.1	38.2
101. Concerning homosexuality:-										
iv] Should homosexual couples be allowed to adopt children?	.31	5	-.31			1401	3.1	8.6	32.3	56.1
26. Should the following be provided or allowed under the NHS?										
i) Trans-sexual surgery	.30	3	.23			1446	9.6	28.6	30.6	31.2
99. Does the individual have the right to commit suicide?	.30	1	.32	3	.22	1409	43.9	34.0	11.7	10.4
47. Should euthansia be possible if a patient has previously agreed to it whilst in full possession of his faculties?	.27	1	.42	6	.38	1408	24.7	43.2	19.2	12.9
32. In which of the following situations in which an abortion has been requested would you think that it should be performed?										
vi) An unmarried woman who is pregnant as a result of failed contraception.	.24	1	.76			1440	28.3	34.3	24.2	13.2
vii) A woman who has failed to use any form of contraception.	.24	1	.64			1432	14.3	25.3	34.1	26.3
26. Should the following be provided or allowed under the NHS?										
iv) Providing Heroin for addicts	.23	3	.28			1441	10.2	27.7	29.6	32.5
10. Should researchers be allowed to research into differences in intelligence between races?	.23	5	.28			1433	30.4	47.5	16.8	5.6
26. Should the following be provided or allowed under the NHS?										
ii) Contraception	.22	1	.30	3	.20	1480	72.2	22.0	3.3	2.5
, Is knowledge an end in itself?	.20					1331	19.2	16.2	28.2	36.4
* Are entrance charges for museums and art galleries desirable?	.16	2	.16			1455	10.8	27.8	31.9	29.6
• Is it reasonable to remove kidneys for transplantation from any accident victim, post mortem, unless specific written evidence to the contrary is found?	-.15					1472	31.6	34.9	21.5	12.0
Should more health education be used to discourage cigarette smoking?	-.15	5	-.18			1487	86.1	22.4	8.7	2.8

	factor 4 loading	factor	loading	factor	loading	N	Def Yes	Prob Yes	Prob No	Def No
38.* Are the powers of the General Medical Council too far-reaching?	-.16	8	-.18	6	.16	764	2.7	17.8	68.5	11.0
67.* Is practical experience more important than academic knowledge in the education of medical students?	-.20					1378	14.2	27.9	36.7	21.3
43. Should all research on test-tube babies be prohibited?	-.20					1449	4.5	7.2	46.7	41.6
31. Should legislation be used to restrict cigarette consumption?	-.22					1471	20.5	20.1	32.1	27.3
29. Should barbiturate prescriptions be controlled by stricter legal procedures?	-.24	6	.43			1279	22.3	50.9	22.9	3.9
101. Concerning homosexuality:-										
14. i) Is it pathological rather than just a variation of normal sexuality?	-.26					1173	4.3	23.6	51.6	20.5
13. iii) Should homosexuals be encouraged to be heterosexual?	-.36					1331	10.1	31.0	42.4	18.8
5. In your opinion does television violence exacerbate teenage crime?	-.45					1418	14.8	47.4	31.5	6.8
6. Is there too much violence on television?	-.54					1446	17.8	42.5	31.4	8.6
7. Is all pornography morally harmful to the individual?	-.65					1455	6.3	12.8	52.5	28.5
Should the public display of pornographic material be more strictly controlled?	-.65					1454	21.0	40.4	32.1	6.5
Should the availability of pornographic material	-.89					1453	18.4	33.4	40.5	9.8

Table   8-5: Shows loadings of individual questions on factor 5, together with
the number of respondents answering that question, and the percentages
giving each of the four possible responses.

	factor 5 loading	other loadings factor loading	factor loading	N	Def Yes	Prob Yes	Prob No	Def No
38. Is privets practice acceptable if it is entirely independent of the NHS?	.51			1435	62.9	28.2	8.0	3.0
76. Is heavy taxation at high income levels discouraging personal initiative and incentive?	.49			1454	35.9	39.1	20.8	4.2
74. Are wage differentials important for encouraging skilled Labour amongst manual workers?	.48			1420	34.5	58.0	5.9	1.6
72. Do you think that capital punishment should be brought back:								
ii] for murder of police or prison officers	.44	2 .60		1434	19.2	22.9	22.2	35.8
iii) for acts of terrorism	.44	2 .55		1438	30.6	22.6	17.5	29.3
Is private practice acceptable for consultants within the NHS using NHS facilities?	.41			1378	14.2	27.9	36.7	21.3
Is commercial competition necessary for progress in drug research?	.38			1454	25.2	52.9	16.1	5.8
Is poverty in this country primarily a result of personal inadequacy?	.32	2 .23		1319	3.4	25.9	47.2	23.5
Should the consultant be the main person to make decisions about resource allocation and priorities in his own hospital?	.30			1385	9.0	48.7	31.9	10.5
Should researchers be allowed to research into differences in intelligence between races?	.28	4 .23		1433	30.4	47.5	16.6	5.6
Is a strong professional identity necessary for the practice of good medicine?	.28			1362	26.2	47.3	20.8	5.9
Do you think that capital punishment should be brought back:								
i. for all murders?	.27	2 .59		1440	10.3	13.1	25.3	51.3
Is aggression part of human nature?	.23			1465	54.5	40.8	3.2	1.5
Should GPs be able to prescribe brand-name drugs when cheaper equivalents exist?	.21	6 -.21		1411	10.5	23.5	44.9	21.1
Is it of any consequence if racial differences in intelligence are demonstrated?	.14	2 .12		1370	15.0	28.6	35.1	21.3

Table 8-5: Continued.

	factor 5 loading	factor	loading	factor	loading	N	Def Yes	Prob Yes	Prob No	Def No
	.09					1409	13.4	25.7	48.3	11.6
*82. Should the doctor-patient relationship be completely confidential, even at the possible risk to other individuals? (e.g. a patient who says that he is sure he is going to murder his wife).										
*30. Should more health education be used to discourage cigarette smoking?	-.18	4	-.15			1487	86.6	22.4	8.7	2.8
22. Are psychiatric hospitals in need of greater funds and resources, if necessary at the expense of other parts of the Health Service?	-.23					1287	8.8	41.6	42.2	7.4
103. Can sociologists provide insight into medical practice?		2	-.34	6	.29		15.4	60.2	20.8	3.8
	-.23					1254				
90. Has sociology a valid place in a university?	-.24	2	-.35	6	.24	1326	28.7	52.5	13.5	5.4
101. Concerning homosexuality:- iv. Should homosexual couples be allowed to adopt children?	-.31	4	.31			1401	3.1	8.8	32.3	56.1
75. Should the distribution of wealth in this country be made more equal?	-.58	2	-.26	3	.21	1389	18.1	31.7	38.9	15.3

Question	factor 6 loading	factor loading		factor loading		N	Def Yea	Prob Yes	Prob No	Def No
29. Should barbiturate prescription be controlled by stricter legal procedures?	.43	4	.24			1279	22.3	50.9	22.9	3.9
81. Is ECT (Electra-convulsive therapy) a treatment whose usage should be more strictly controlled?	.40					1108	28.5	46.1	21.6	3.8
47. Should euthanasia be possible if a patient hes previously agreed to it whilst in full possession of his faculties?	.38	1	.42	4	-.27	1406	24.7	43.2	18.2	12.9
45. Would you welcome more articles about medicine in the newspapers if the articles were responsible and accurate?	.38	2	-.21			1481	83.8	27.9	8.8	1.9
39. Should amniocentesis be compulsory for all pregnant women?	.35	3 2	-.43			1048	7.4	22.7	32.5	37.5
107. Should more consideration be given to social and psychological factors in disease?	.34		-.22	3	.21	1419	28.8	83.4	7.3	0.8
108. Is it reasonable to object to the use of ECT simply because its mode of action is unknown? -	.31	3	-.24			1280	8.0	28.2	45.0	18.8
03. Can sociologists provide insights into medical practice?	.29	2	-.34	5	-.23	1254	15.4	80.2	20.6	3.8
5. Should more cancer patients be told the true nature of their condition?	.28					1372	24.2	49.1	24.8	1.9
7. Does parapsychology (ESP, psychokinesis, etc.) deserve serious study?	.27					1316	33.2	50.9	12.5	3.4
0. Has sociology a valid place in a university?	.24	2	-.35	5	-.24	1326	28.7	52.5	13.5	5.4
12. Should greater status be given to ability and experience rather than to educational qualifications?	.23	3	.25			1378	30.9	55.5	12.4	1.2
7. Should there be encouragement of profit-sharing schemes for employees?	.23	3	.21			1406	36.3	58.1	4.6	1.1
3. Do patients have the right to full information about their own illnesses?	.22					1455	40.1	42.3	15.1	2.5
5. Should students be encouraged to question views expressed by consultants?	.22	3	.29			1450	44.7	51.5	3.8	0.2
Concerning homsexuality:- ii). Are homosexuals born rather than made?	.21					1316	3.0	38.4	48.1	12.5
S. Is it likely that criminality will be shown to be a genetic trait?	.18					1324	1.7	22.4	81.2	14.8
S. Are the powers of the General Medical Council too far-reaching?	.18	8	-.18	4	.18	764	2.7	17.8	68.5	11.0
I. Should GPs be able to prescribe brand-name drugs when cheaper equivalents exist?	-.21	5	.21			1411	10.5	23.5	44.9	21.1
I. Do you think that the financial reward of the GP is satisfactory relative to other branches or medicine?	-.24	3	.22			1213	18.7	53.0	21.4	5.9

Table 8-7: Shows loadings of individual questions on factor 7, together with the number of respondents answering that question, and the percentages giving each of the four possible responses.

	factor 7 Loading	factor loading factor loading	N	Def Yes	Prob Yes	Prob No	Def No
92. Should children be given sex education at the following ages:							
ii. 6 – 9 years?	.91		1421	16.6	26.8	31.9	24.0
i. before 5 years?	.86		1369	7.3	9.1	24.9	58.7
iii. 10 – 12 years?	.53		1432	52.9	35.3	8.0	3.8

Table 8-8:   Shows loadings of individual questions on factor 8, together with the   number of respondents answering that question, and the percentages giving each of the four possible responses.

	factor 8 loading	factor loading		factor loading		N	Def Yes	Prob Yes	Prob No	Def No
54. Do you think the GP deserves as much prestige in the medical profession as does the hospital consultant?	.52	2	-.22			1419	44.1	38.4	14.9	2.8
59. Are GPs as well qualified as hospital consultants?	.45					1249	14.3	38.3	39.2	8.2
52. Do you think the GP will play a vital role in the delivery of medical care in the future?	.31	3	.25			1428	48.2	43.8	7.2	0.7
55. Do you think the GP should play a Larger role in the teaching of the medical student?	.38	3	.31			1403	38.8	48.8	11.4	1.3
*38. Are the powers of the General Medical Council too far-reaching?		4	-.18	8	.18					
99. Should the consultant be the only person responsible for making decisions about patient management?	-.18	3	-.19			784	2.7	17.8	68.5	11.0
58. Do you think most doctors enter general practice because they would be unable to get a hospital consultant's post?	-.19					1414	2.4	10.6	52.3	34.7
53. Do you think the working environment of the GP is less intellectually stimulating than that of the hospital consultant?	-.39					1339	1.3	17.3	60.2	21.2
	-.46					1439	18.7	45.2	24.3	11.8

Table 8-9: Shows the inter-correlations between the two super-ordinate factors and the eight main factors.

		Super-ordinate factors	
		I "Libertarianism"	I I "Tough-mindedness"
1	"Vital liberatarianism"	.827	.159
2	"Social tough-mindedness"	.088	.723
3	"Liberalism"	.307	-.474
4	"Personal Libertarianism"	.483	-.107
5	"Economic conservatism"	.060	.542
6	"Medical control"	.047	-.102
7	"Sex education"	.157	-.122
8	"General practice"	-.023	-.047

Table 8-10: Shows the inter-correlations between the scores of subjects on the eight main factors and two superordinate factors after intervals of from one to four years, and the significance of the linear trend in the correlations across years.

Factor	All subjects	One year	Two years	Three years	Four years	Significance of trend
N	.186	51	45	57	34	
1	.589	.574	.793	.628	.092	p<0.05
2	.608	.773	.547	.475	.648	NS
3	.534	.633	.484	.472	.525	NS
4	.716	.876	.649	.594	.728	p<0.05
5	.656	.635	.421	.779	.605	NS
6	.463	.491	.604	.415	.275	NS
7	.441	.346	.422	.305	.751	NS
8	.412	.694	.437	.139	.251	p<0.001
I	.667	.752	.821	.553	.358	p<0.01
II	.731	.864	.625	.708	.747	NS

9: The ethical attitudes of medical students: correlates and changes.

"Medical educators seem, in general, to be
relatively disinterested in the attitudes towards
medicine which students bring with them to
medical school, and in the further evolution of
those attitudes during the undergraduate course".

Maddison (1978; p.102)

Summary.

The ethical attitudes of medical students in the St. Mary's study are examined in relation to social, educational and personality background factors. In the Birmingham study the attitudes were examined in relation to age, year in medical school and cohort of entry. Some of the attitudes changed as a consequence of medical schooling _per se_, while others changed as a function of ageing or maturation. Cohort trends in some attitudes suggested changes over recent years in factors operating prior to medical school entry.

The present chapter asks how the eight ethical attitudes of medical students, which were identified in the previous chapter, relate to background factors, and to personality, and how those ethical attitudes change as students pass through medical school.

Background correlates of ethical attitudes.

Entrants to medical school show a range of attitudes to ethical problems, and it is those attitudes which primarily determine subsequent attitudes; indeed Rezler (1974) has suggested that it is perhaps only those attitudes which determine later attitudes. It is therefore of some interest to ask which factors, in the social and educational background, or in personality, relate to differences in attitudes, both in those applicants who subsequently enter a medical school, and those who are rejected by all their medical school choices.

Method.

Table 9-1 summarises the background variables which were used in the analysis. Statistical analysis was by means of the NEW REGRESSION program of the SPSS package (Hull and Nie, 1981). The effects of background variables were determined by a hierarchical analysis of variance for each dependent variable (the eight orthogonal attitude scales and the two superordinate scales). At each step that independent variable was entered which could best account for the variance remaining after the variables already in the regression equation had been taken into account. It should be noted that factor scores have been normalised so that scores from the the whole reference population (which also included other medical students and prospective medical students) had means of zero and variances of unity.

<u>Results.</u>

Table 9-2 shows the results of the multiple regression analyses. For each of the eight orthogonal scales, with the exception of 1: Vital Libertarianism, there was evidence of a predictive effect of some of the background variables. Of the two superordinate dimensions, only II: Tough-mindedness showed any correlation with the background variables; I: Libertarianism had no significant correlates at all.

Table 9-3 shows the correlations of each of the attitude scales with the four personality dimensions of the EPQ. Extraversion and Neuroticism show no important correlations, although there are a few marginally significant relationships. Both P and L scores show highly significant correlations with factor 4, Personal Libertarianism, those most in favour of personal liberty being more psychotic and having lower lie scales (or being less 'socially acquiescent') than other students (see chapter 11 for a more detailed discussion of the nature of the L scale in the EPQ). In addition high L scorers were less liberal and more tough-minded than low L scorers.

<u>Discussion: Background correlates of ethical attitudes.</u>

The most interesting aspect of these results is the different patterns of correlation between attitude scores and background factors. Schooling has an influence on five of the eight orthogonal factors, which is in contrast to its minimal effects on the cultural behaviour of applicants (see chapter 11). Smaller sixth forms produce applicants who have higher scores on 4: Personal Libertarianism and 7: Sex Education, while larger overall school size produces applicants with higher scores on 6: Medical Control. Schools sending a higher proportion of their

sixth form to university produce applicants with higher scores on 2: Social Toughmindedness and 6: Medical Control. Schools from the private sector (i.e 'Public' schools) produce applicants who have higher scores on 5: Economic conservatism. The educational achievements of applicants have little influence upon attitudes, the only exception being that applicants with lower 0-level grades score more highly on 4: Personal Libertarianism. The age of applicants relates to several scales, either directly (younger applicants scoring more highly on 2: Social tough-mindedness, 8: General practice, and II: Tough-mindedness) or indirectly, post-A-level applicants scoring more highly on 4: Personal Libertarianism, and 7: Sex Education. Coming from a medical family showed two correlates: scoring higher on 4: Personal Libertarianism and lower on 6: Medical Control. The sex of applicants relates to several scales, women applicants scoring higher on 5: Economic Conservatism, 6: Medical Control, and 7: Sex Education, and lower on 2: Social Toughmindedness, 4: Personal Libertarianism, and II: Tough-mindedness. The correlations of attitudes with age, and with high social status (e.g. public schooling and medical parents) are broadly similar to such correlations reported by Shuval (1980; p.121).

The details of the candidates' UCCA application showed minimal correlations with attitudes, with the sole exception that those applicants who put fewer London medical schools on their UCCA form tended to have higher scores on 3: Liberalism. The eventual destination of candidates relates to two scales; those rejected by all of their choices of medical school tended to score more highly on 3: Liberalism and 6: Medical control.

The correlations of attitudes with personality are of some interest as Eysenck (1954) has put forward a series of theoretical arguments using the concepts of learning theory to suggest that tough-mindedness should show correlations with extraversion. (Note however that he does not suggest that radicalism should be related to neuroticism; Eysenck, 1954; p.236). It is clear however from table 9-3 that no such correlations (between E and factors 2,3,5 or II) are significant in this study, thus throwing Eysenck's hypothesis into some doubt. The hypothesis cannot even be readily salvaged by arguing that on the EPQ the relevant aspect of extraversion is in fact manifesting within the psychoticism dimension (see McManus and Weeks, 1982; McManus, 1983) since even then the appropriate correlations are not significant.

The development of ethical attitudes in medical students.

A number of studies (Becker et al, 1961; Coombs and Stein, 1971; Merton et al, 1957; Simpson, 1972) have described the development during medical school of a 'medical student ethos', which involves specific sets of assumptions about patients and medical practice, and is necessarily a direct consequence of the medical school sub-culture. However of much broader interest is the effect of medical school in determining ethical, social and political attitudes in areas which are held in common with the general public, which directly affect the relations of doctors and public, and which are naturally the subject of media concern.

Early studies (e.g Eron, 1955) suggested that students were idealistic on entering medical school, but that they became increasingly cynical as they passed through medical school. Becker and Geer (1958), in an influential paper, argued that the cynicism, although real, was strictly demarcated, being applied principally to medical school and to

medical education themselves, and not to medicine _per se_; "... as school comes to an end the cynicism specific to the the school situation also comes to an end, and their original and more general idealism comes to the fore again, though within a framework of more idealistic alternatives" (p.55). Rezler (1974) reviewed studies of attitude change, and concluded, "it seems that medical school does contribute to the development of cynicism in students and that participation in a liberalised curriculum does not remove this trend ... Medical education certainly does not seem to increase student humanism or benevolence; at best it leaves attitudes intact in those students who exhibit them to a high degree at entrance" (p.1025).

More recent studies have found conflicting results. Feather (1981) concluded that there was "considerable stability in the value priorities and attitude positions of [Australian medical] students", while Leserman (1980) found that American "medical students generally become more conservative on political and economic issues ... during medical training", and Juan _et al_ (1974) found some evidence for decreased dogmatism as students passed through medical school (although they raise the possibility that the result could be an artefact of regression to the mean, although the finding was also reported by Webb and Linn (1977)). Rothman _et al_ (1973) found changes in personality towards increased 'endurance' but decreased 'need for order' and 'understanding' as the course progressed, and Perricone (1974) found in a longitudinal study that students showed increased 'social concern' as they passed through medical school. Bonito and Levine (1975) emphasised that studies of medical student attitudes must distinguish between effects of socialisation, self—selection and specific cohort effects.

The general trend in studies of medical students, towards increasing conservatism as they pass though medical school, is in direct opposition to the general conclusions of studies of non-medical students. "Changes of attitudes observed during college years were, as a rule, in the direction of liberalism", concluded Evans (1965, p.9) after reviewing four such studies, and the longitudinal study of Murphy and Likert (1938) is a fifth study giving a similar result.

The increase in age of medical students as they pass through medical school complicates the interpretation of any changes that may occur, since change may be a non-specific effect of maturation rather than a specific consequence of medical schooling itself. The possible lack of specific effects of training _per se_ upon attitudes is supported by the general lack of effect of specific teaching upon attitudes (e.g. Rezler, 1974; Dornbush et al, 1984). In this section is described a study of medical student attitudes which separates age effects, medical school effects and cohort effects, and shows that different attitudes have different relationships to these effects.

Method

The Birmingham study used a modified cross-sequential design

(Schaie, 1965); see chapter 1 for a more detailed description. A cross-sequential design may be analysed in terms of any two items from cohort, year of study and year of testing. Following the recommendation of Baltes _et al_ (1977) only cohort and year of study effects have been considered, since the primary concern is with ontogenetic effects.

Statistical analysis for significance of effects was by means of the SPSS ANOVA program (Nie et al, 1975). Effects of age (A), years in medical school (M), and cohort of entry (C) were examined. In order to test the effect of A a main-effects model involving M and C was fitted as the first stage of the analysis. At the next stage the linear component of A was added to the model and its significance assessed by the improvement in the variance accounted for. Similar procedures were used to test the independent effects of M and C.

A, M and C are necessarily highly correlated, since students in the clinical years are also the older students in the study. In view of this multicollinearity of A, M and C, estimates of effect sizes were obtained by the method of ridge regression (Price, 1977), using a main effects model of A, M and C in which each level of each explanatory variable was represented by a dummy variable. Empirically it was found that a value of K of 0.345 reduced the mean variance inflation factor to unity, and this value was used in computing the ridge regression estimates for each of the dummy variables. It should be noted that the use of ridge regression only affects the estimation of effects; the significance of effects was assessed in the standard way.

Results.

Figures 9-1 and 9-2 show the fitted estimates for each of the eight simple factors and the two super-ordinate factors, as a function of the age of the student, the number of years they had been in medical school, and their cohort of entry into medical school. Significance levels for the independent linear trends for each variable (i.e. after taking account of the other two variables) are indicated by the asterisks alongside each graph.

Age. Older students show significantly higher scores on factors 1: Vital libertarianism, 3: Liberalism; and I: Libertarianism, and lower scores on factors 2: Social tough-mindedness, 5: Economic conservatism, and II: Tough-mindedness. There were no significant effects of age upon factors 4, 6, 7 or 8.

Year of study in medical school. Students who had been at medical school for a greater length of time showed higher scores on factors 3: Liberalism and 8: General practice, and lower scores on factor 6: Medical control and II: Tough-mindedness. There were no significant correlations with factors 1, 2, 4, 5, 7, or I.

Cohort of entry to medical school. More recent entrants to medical school tended to have higher scores on factor 8: General practice, and lower scores on factors 1: Vital libertarianism, 2: Social tough-mindedness; 5: Economic conservatism; I: Libertarianism, and II: Tough-mindedness. There were no significant linear cohort trends on factors 3, 4, 6, or 7.

Discussion: the development of attitudes.

Of particular interest in these results is that the two related factors of age and year of study in medical school show different patterns of correlation with attitudes, after the effects of the other two explanatory variables have been taken into consideration. Such patterns of correlation allow one to make inferences about causation (Kenny, 1979). Thus students become more in favour of general practice and less in favour of medical control not because they are growing older but because they have studied longer at medical school; conversely students become more sympathetic to abortion etc., less socially tough-minded, less economically conservative and more libertarian because

they are growing older, and not because they are passing though medical school. The effects of the medical school ethos in modifying attitudes are therefore strictly demarcated. Two factors, becoming more liberal (3) and less tough-minded (II), show separate and independent effects of both age and year of study, implying independent causal mechanisms for the two effects.

The study also shows that there are trends in the attitudes of students over the nine-year period 1973-1981, those entering at the end of that time differing on some but not all of the sets of attitudes. Presumably such changes either reflect changes in background, schooling, society, or selection, and are not a consequence of medical schooling, per se.

The different patterns of correlations between attitudes and age, year of study and cohort of entry provide support for the factor analytic differentiation of the attitudes into separate clusters, the implication being that each has its own separate causal influences. The reasons for individuals differing in attitudes, or for changing their attitudes, are complex (Insko, 1967) and in the particular case of medical students will require further study. That some changes are a consequence of medical schooling is not, of course, to suggest that attitudes are taught directly. As Merton (1957) has put it, "not all which is taught in medical school is actually learned by students and ... not all which is learned is taught there...".

Figure 9-1. Shows estimates of independent effects of age, year of study and cohort of entry to medical school for each of the first five orthogonal attitudes. Each individual graph shows the effect size as estimated from ridge regression coefficients (see text). Points are only plotted if at least 50 individuals contributed to the point. Sample sizes in the total sample are shown across the top of the columns. Significance levels for linear trends are indicated alongside data sets (*: $p<0.05$; **:$p<0.01$; ***: $p<0.001$; No indication: Not significant). The ordinate is in standard deviation units with respect to the entire reference population (see text). Since points within individual graphs are only plotted relative to one another the absolute position of individual graphs is arbitrary, and has been adjusted for display purposes.

230   120   144   132   56   82   162 172
253   137   103   474   118   95   53   59   146 141   92

*

1 Vital libertarianism

**

2 Social toughmindedness

***

*

3 Liberalism

***

***

4 Personal libertarianism

5 Economic conservatism

***

***

***
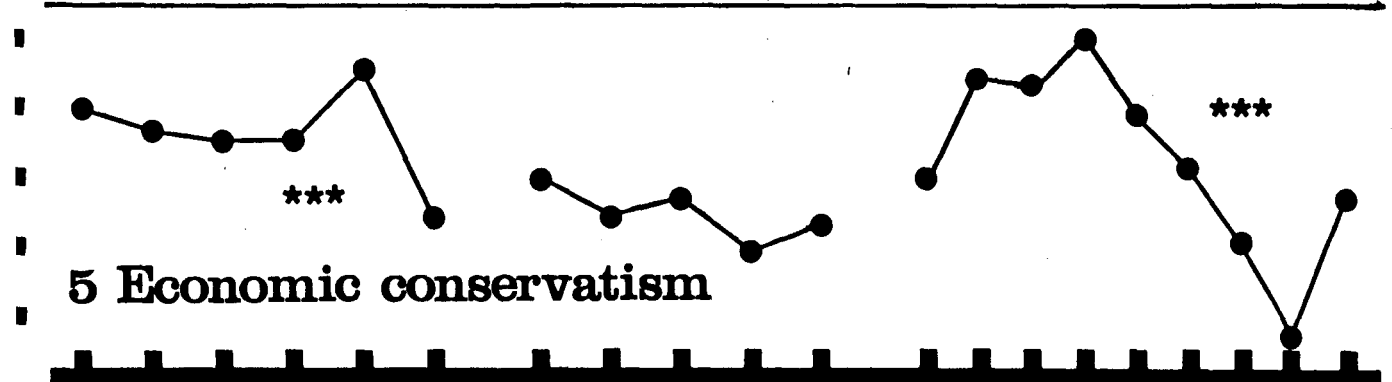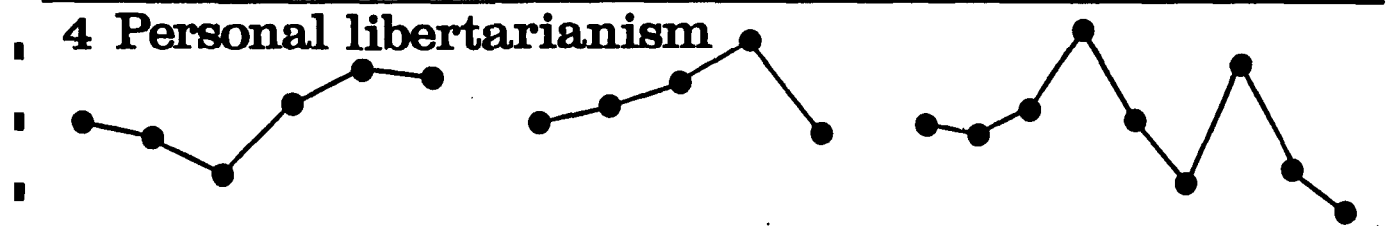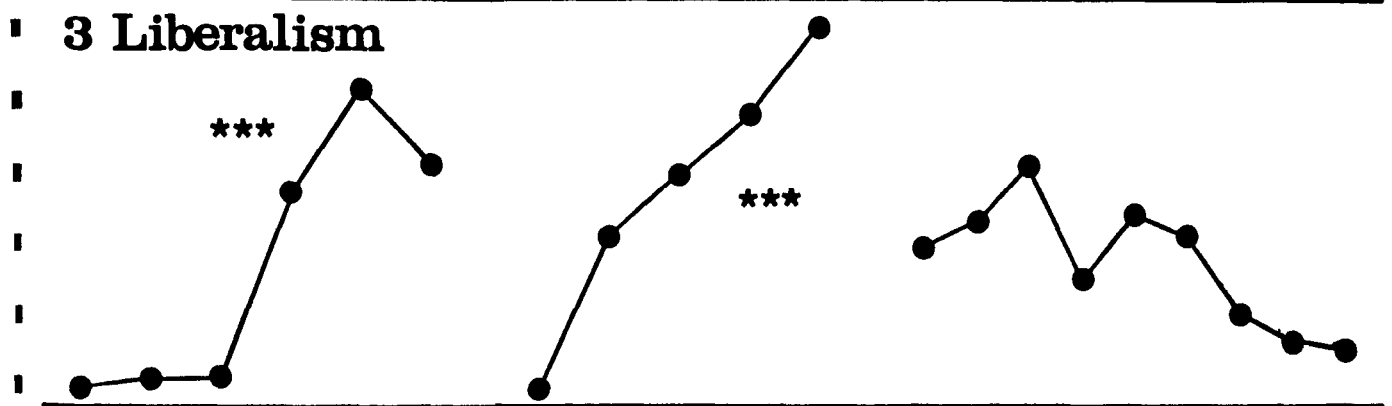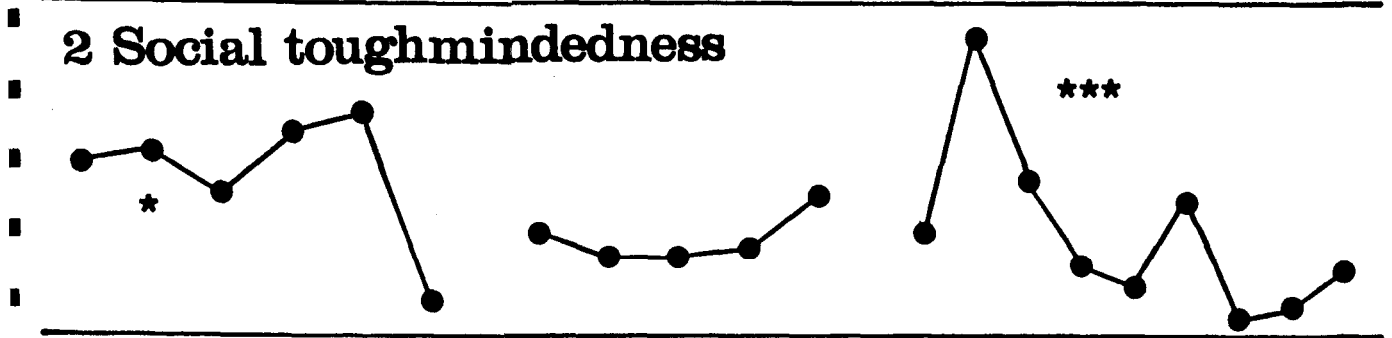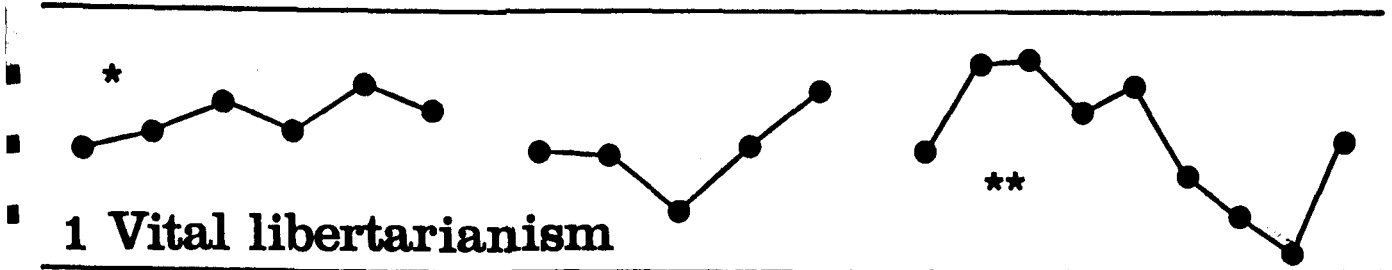
18 19 20 21 22 23   1 2 3 4 5   73 75 77 79 81

Age   Year   Cohort

Figure 9-2. As for figure 9-1, but for the last three orthogonal factors and the two super-ordinate factors.

6 Medical control

7 Sex education

8 General
practice

I Libertarianism

II Toughmindedness

| 18 19 20 21 22 23 | 1 2 3 4 5 | 73 75 77 79 81 |
| Age | Year | Cohort |
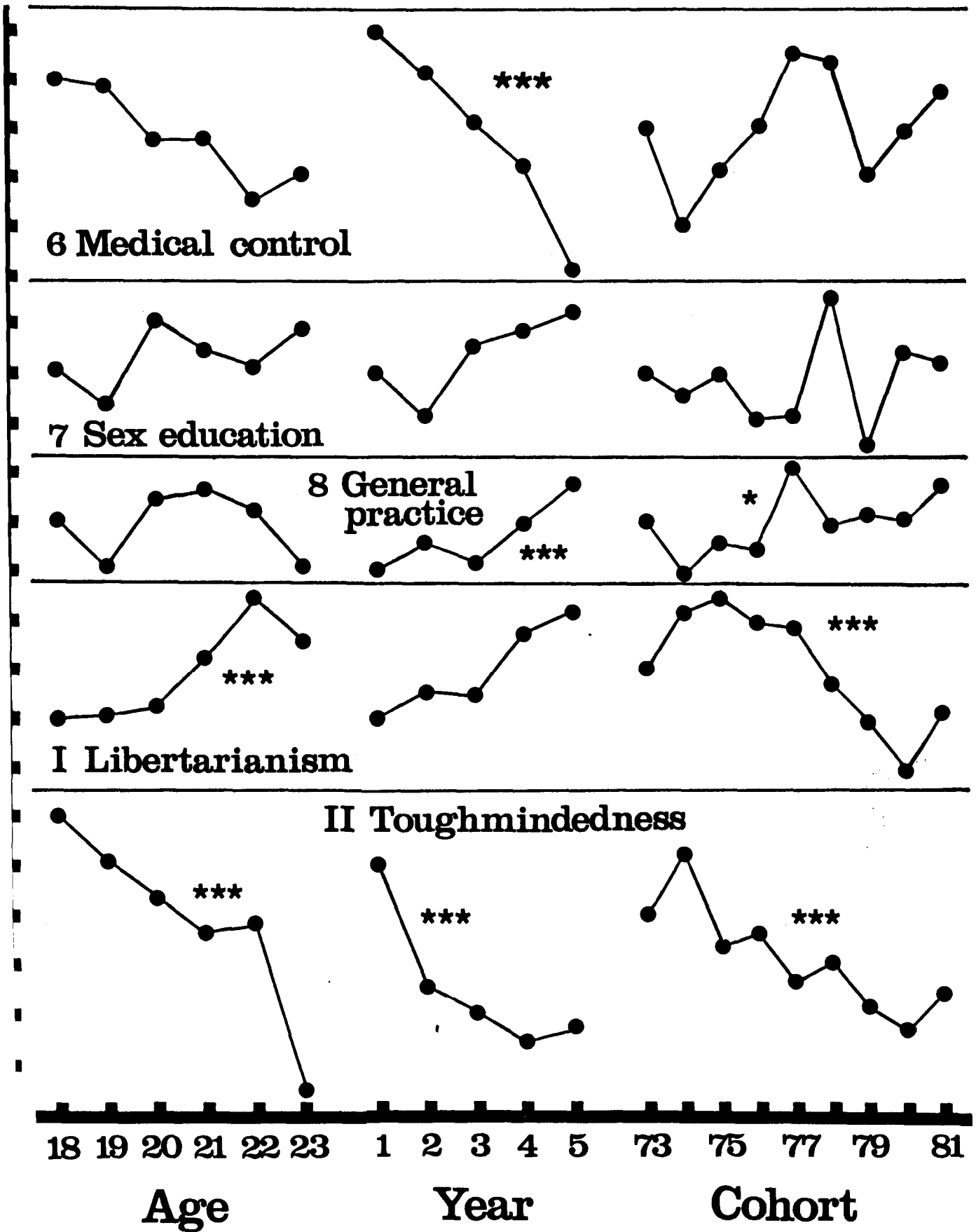
Table 9-1: Shows the 25 background variables which were included
in the hierarchical analyses reported in tables 9-2 and 11-1.

Variable   Description.

SEX   Sex of applicant

CLASS   Social class of applicant

MEDFAMIL   Applicant from a medical family (at least one parent
                  a doctor)

NORTH   Applicant from the north of England, Scotland or
                  Northern Ireland.

SECTOR   Applicant educated in a private sector school (i.e.
                  a 'public' school).

SCHFULL   Overall size of applicant's school

SCHSIXTH   Number of students in sixth form of applicant's school

SCHUNIV   Number of students from applicant's school going to
                  university each year

SCHPROP   Proportion of applicant's sixth form going to
                  university each year

TOTOLV   Total number of 0-levels taken

TOTOLVM   Mean 0-level grade attained

TOTCLV   Total number of A-levels taken

TOTCLVM   Mean A-level grade attained

MATHS   Maths taken at A-level

BIOLOGY   Biology taken at A-levels

POSTALEV   Applicant applying to UCCA after taking A-levels

PREVAPP   Applicant has made a previous UCCA application

NLONDON   Number of London medical schools on UCCA form.

NMEDIC   Number of Medical schools on UCCA form

NCHOICE   Number of Choices of university on UCCA form

AGE   Age of candidate on 30th September 1981.

MATURE   Mature applicant (i.e. aged 21 or over on 30-9-1981)

ORDER5   Amount of bracketing used on UCCA form.

UCCADATE   Date of receipt of UCCA form at UCCA.

OXBRIDGE   Oxford or Cambridge included on UCCA form.

ACCEPT   Applicant entered a medical school in October 1981.

Table 9-2: Shows hierarchical multiple regressions of the eight
orthogonal attitude factors and of the two superordinate
attitude factors. Descriptions of variables have been modified
so that all beta coefficients are positive.

Order of Entry	Variable	Beta	p
Dependent variable = 1: Vital Libertarianism			
	No significant correlates.		
Dependent variable = 2: Social Toughmindedness Multiple R = .249			
1	Higher proportion of sixth form going to university	.174	.002
2	Male applicant	.124	.027
3	Younger applicant	.123	.026
Dependent variable = 3: Liberalism Multiple R = .211			
1	Rejected for medical school	.163	.012
2	Less London medical schools on UCCA form	.157	.005
Dependent variable = 4: Personal Libertarianism Multiple R = .275			
1	From a medical family	.123	.013
2	Smaller school sixth form	.141	.026
3	Male applicant	.150	.028
4	Lower average 0-level grades	.115	.037
5	Applying post-A-level	.110	.046
Dependent variable = 5: Economic conservatism Multiple R = .276			
1	Female applicant	.171	.001
2	Private sector schooling	.144	.006
3	Less A-levels taken	.142	.010
Dependent variable = 6: Medical Control Multiple R = .321			
1	Rejected for medical school	.210	<.001
2	Not from a medical family	.125	.032
3	Higher proportion of sixth form going to university	.176	.012
4	Larger overall school size	.131	.038
5	Female applicant	.125	.022
Dependent variable = 7: Sex Education Multiple R = .243			
1	Female applicant	.156	.002
2	Post-A-level applicant	.125	.024
3	Smaller school sixth form	.115	.041
Dependent variable = 8: General Practice Multiple R = .161			
1	Younger applicant	.161	.004
Dependent variable = I: Libertarianism			
	No significant correlates		
Dependent variable = II: Tough-mindedness Multiple R = .214			
1	Male applicant	.176	.002
2	Younger applicant	.122	.028

Table 9-3: Shows Pearsonian correlations between the four dimensions of the Eysencks' Personality Questionnaire and the eight orthogonal measures of ethical attitudes, and the two superordinate measures of attitudes. NS: Not significant; +: p<0.10; *: p<0.05; **:p<0.01; ***:p<0.001.

	E		N		P		L	
1: Vital Libertarianism	.070	NS	.041	NS	-.113	*	.042	NS
2: Social Tough-mindedness	.009	NS	-.020	NS	.032	NS	.117	*
3: Liberalism	-.042	NS	.042	NS	.139	*	-.218	***
4: Personal libertarianism	.109	+	.130	*	.262	***	-.261	***
5: Economic conservatism	.086	NS	-.035	NS	-.087	NS	-.027	NS
6: Medical Control	.031	NS	.131	*	.037	NS	-.012	NS
7: Sex Education	.024	NS	-.043	NS	-.077	NS	.002	NS
8: General Practice	.031	NS	-.073	NS	-.128	*	.059	NS
I: Libertarianism	.111	*	.105	+	.051	NS	-.135	*
II: Tough-Mindedness	.056	NS	-.057	*	-.118	*	.204	***

10: The culture of medical students: Measurement.

"Reading maketh a full man; conference a ready
man; and writing an exact man ... <u>Histories </u>make
men wise; <u>Poets </u>witty; the <u>Mathematicks </u>subtill;
<u>Natural Philosophy </u>deepe; <u>Morall </u>grave; <u>Logick </u>and
<u>Rhetorick </u>able to contend"
                          Francis Bacon, <u>Of Studies.</u>

"What [people require] is not to be taught other
people's opinions, but to be induced and enabled
to think for themselves ... They cannot read too
much. Quantity is of more importance than
quality, especially all reading which relates to
human life and the ways of mankind; geography,
voyages and travels, manners and customs, and

romances   By such reading they would
become ... cultivated beings".
                              - John Stuart Mill,
                          letter to the Rev. H.W.Carr,
                                 7th January, 1852;
                          in Fletcher (1971; pp 394-5).

 "... our knowledge of the history of
reading habits, of the statistics and quality of
literate response at different moments and in
different communities of Western Europe
is still rudimentary ... The evidence is hard
to come by and harder to assess..."

        George Steiner, <u>In Bluebeard's Castle.</u>

Osler ... believed that culture ... was of the
utmost value to medical men"
                 Sir Geoffrey Keynes (1981; p.395)

"In using the word culture I am thinking of the
inherited tradition. Im a thinking of something
that is in the common pool of humanity, into
which individuals and groups of perople may
contribute, and from which we may all draw <u>if we
have somewhere </u>to <u>put </u>what we <u>find</u>".

        D.W. Winnicott (1967; emphasis in original)

Summary.

The responses of 1325 medical students and prospective students in the Birmingham, Cambridge and St. Mary's studies to 90 questions **concerning** interests, hobbies, and cultural activities are analysed. Factor analysis revealed five orthogonal factors which have been labelled as Literary Culture, Low-Brow Culture, Travel, Popular Culture and Non-Literary Culture. A single factor could account for 42.7% of the common variance, and it was shown to load positively on all five factors except Popular Culture, which showed a negative loading.

"Culture is one of the **two** or three most complicated words in the English language" (Williams, 1976, p.76). This is primarily because it has at least three distinct but overlapping meanings; a global description of the way of life of a society (see e.g. Peterson, 1979); assistance in the development of individuals within a society; and the arts in general as occurring in a society. As applied to an individual, 'cultured' tends to mean an involvement in the arts in their most general sense. Necessarily these meanings all overlap. An individual cannot be 'cultured' if the arts do not exist within a society, and the existence of art-forms is dependent upon the total social and economic organisation of that society. Finally individuals do not just 'have' culture (any more than societies do), but rather it is nurtured within them to a greater or lesser degree by the organisation of the society (see e.g. Eliot (1962), p.24).

When applied to a particular sub-group, such as doctors or medical students, culture can refer specifically either to their specialist knowledge and mores, (qualitative accounts of which may be found elsewhere, albeit primarily for the American system of medical education; Coombs and Stein, 1971; Becker <u>et al</u>, 1961; Merton <u>et al</u>, 1957; Simpson, 1972) or can refer to the extent to which they share the general or common culture of their society. This latter aspect will be considered in the present chapter, in which is described the non-specialist behaviour of medical students, both in relation to the arts and to other activities, in as atheoretic manner as possible, using a questionnaire to assess the 'natural history' of cultural behaviour. The intentions of the chapter are therefore descriptive rather than <u>Pre</u>scriptive. The statistical methods of factor analysis are used to describe the differences <u>between</u> individuals (and hence to produce de scriptions of <u>individual</u> culture) . The aggregate behaviour of the

whole group will be described as a way of assessing the sub-culture (and hence its relation to the rest of society). Chapter 11 will describe the changes that occur in the sub-culture as individuals pass through it, and will attempt to account for individual differences in culture and change in culture in terms of background variables.

Although this study is concerned primarily with the culture of <u>medical students,</u> this is not to suggest that the methods or results are only applicable to that group. Rather they have been studied because the origins and nature of their eventual attitudes are of consequence to the subsequent practice of medicine, and they represent a clearly demarcated group for whom an eventual goal in society is obvious. There is little doubt however that the method of study would be applicable with little alteration to any other group of equivalent intellectual ability, and with some modification could be applied to less intellectually able groups.

A concern of many psychologists and sociologists over a number of decades has been the creation of psychometric tests (of intelligence, personality, etc..) which are <u>culture-free.</u> The present study takes a diametrically-opposite view and attempts to measure culture itself in a direct manner. As such it could be used to ask whether indeed any other test is free of cultural effects, and to assess whether culture is an independent determinant of success (see e.g. DiMaggio, 1982). In passing it may be noted that Cattell and Warburton (1967) described three tests which have a similar although more limited basis than the present, in which they assess what they call 'High-brow tastes' (test T.27), 'Reading preferences' (test T.5) and 'Book preferences' (T.25). These tests have been criticised by Kline (1983) precisely because they are not culture-free (which would seem desirable if, as Cattel and Warburton

claim, they are to be regarded as personality tests); such criticism cannot be offered in the present case since the intention is not to assess personality but rather to assess culture itself. Whether culture relates to personality, as Cattell and Warburton suggests, will be considered in the following chapter.

Method.

A pilot survey was carried out in the medical school of the University of Birmingham during 1974 (McManus, Daniels and Cruickshank; unpublished). A questionnaire was distributed to all medical students in all years but the final one. Amongst other questions the students were asked about their cultural interests and leisure activities. On the basis of that pilot study a more extensive questionnaire was developed which was distributed to three separate groups of students:

1.   The Birmingham study.

2.   The Cambridge study.

3. The St. Mary's study.

Response rates in the studies were almost identical to those described in chapter 8 on the structure of ethical attitudes. The questionnaire (see appendices to chapter 1) contained items assessing the manner in which leisure time was spent, the hobbies and interests of the student, an assessment of reading habits, and a list of the countries which the student might have visited. Statistical analysis was by means of the Statistical Package for the Social Sciences (SPSS) (Nie et al, 1975; Hull and Nie, 1981).

<u>Results.</u>

Overall 1516 questionnaires **were** completed by 1325 subjects. Not all subjects answered all questions and hence totals often differ from these values.

The results can be considered in two forms. Firstly one may consider the absolute responses of the students i.e. How many did or did not take part in particular activities? Although of substantive interest in defining the culture of the group as a whole, these results are not easy to interpret, for several reasons. There is no method of checking on the reliability of an individual's responses, inaccuracies perhaps occurring because of misunderstandings of questions, or even due to wilful distortion. For the interpretation of population results as a whole it is also necessary to be sure that the sample is unbiased, and this is difficult to guarantee, particularly when response is both entirely voluntary and by post, as in the Birmingham and Cambridge samples. Nevertheless the absolute results are not without interest, and are reported here in some detail, partly to allow adequate interpretation of the later correlational studies, partly because of their own intrinsic interest, and partly to form a basis for subsequent comparative studies.

Tables 10-1 to 10-5 summarise the questions which students were asked. Table 10-1 concerns general activities and interests, while Table 10-2 considers newspaper and journal reading, Tables 10-3 and 10-4 consider the fiction and non-fiction authors whom the student has read, and Table 10-5 considers the student's travel habits. For each set of questions is given the number of students producing a valid response (N), and the percentages replying in each of the possible response categories, which are given at the top of each column. Below the names of the response categories (in brackets) are the scale values that the responses

were given for the purposes of calculating correlations. The column marked 'Trend by year of study' shows the results, for those in the Birmingham study only, of a correlation (using Kendall's tau statistic) of the response categories against the year of study of the student (first to fifth). '+' responses indicate that the behaviour increased in frequency with increasing year number, while '-' values indicate a decreasing frequency. The statistical significance of effects is indicated by the number of symbols i.e. '(-)' and '(+)': $p < 0.1$; '-' or $p < 0.05$; '--' or '++': $p < 0.01$; '---' or '+++': $p < 0.001$. 'NS' indicates Not Significant, and N/A indicates Not Applicable. The remaining columns in the Tables will be considered later.

Although most of the Tables are self-explanatory, some further comment will be of use. Table 10-1 summarises a number of questions designed to cover a broad range of interests and activities, from watching television and going to the pub, to attending opera and ballet. The major constraint in choosing the items was that the questions should not be too lengthy, and that most students should be able to answer some of them in a positive manner. Table 10-2 assesses the newspapers and journals that the student read, either regularly or irregularly. 'The Star' newspaper, which came on the market after the questionnaire was first distributed in Birmingham, was only included as a separate item in the St. Mary's survey. Prior to that it is probable that a number of students have confused it with the 'Morning Star' (the official newspaper of the Communist party). 'The Listener' and 'New Society' were not included on the early questionnaires, and are only present for the St. Mary's sample. Tables 10-3 and 10-4 were designed to cover, in a fairly systematic way, a broad range of reading material, both fiction (24 authors; Table 10-3) and non-fiction (16 authors; Table 10-4). In addition Table 10-1 reports two broad questions on the number of books

read each year, both fiction and non-fiction. The fiction authors were chosen to cover the entire range from James Joyce to Harold Robbins, with nineteenth century and earlier authors being included, along with a number of modern and classic foreign writers. Several authors of greater specific appeal to women were included, as also was a science-fiction writer. The list was designed so that very few of the students would have read none of the list, even if perhaps, as in the possible cases of Jane Austen, George Orwell, or Aldous Huxley, it was in the form of a single work on a school examination syllabus. The non-fiction authors were chosen to cover a broad range of subjects, from politics and philosophy to art history and economics, including a number of 'alternative' writers, and some who are frankly populist in their approach, as well as a few classics such as Darwin and Mill. An error in the list of authors in Table 10-4 was the inclusion of C.S. Lewis; the intention had been to include a modern popular theologian, but in so doing we forgot his extensive writings for children, which probably dominate the response to the question (and also account for the poor trend by year of study).

Of greater interest and methodological justification than the absolute results of the questions, is the study of the inter-relations between items, and their use as a method of analysis of individual differences in culture.

Tables 10-1 to 10-5 contain a total of 90 separate questions. The inter-relations between the responses to these questions were studied by means of a principal factor analysis, followed by a Varimax rotation of the significant factors. The correlation matrix was calculated by the method of 'pairwise' deletion of missing values. The first ten eigen-values of the correlation matrix were 8.96, 3.85, 3.16, 2.68, 2.37,

2.05, 1.99, 1.87, 1.77 and 1.68. Examination of these values by the 'scree-slope' criterion (Cattell, 1966) suggests that only the first five factors are significant, and that the first factor is more important than the rest. The first five factors together account for 23.4% of the total variance in the matrix, with the first factor alone accounting for 42.7% of the common variance. After Varimax rotation these five factors accounted for 26.1%, 23.3%, 20.1%, 16.8% and 13.7% of the common variance. Tables 10-1 to 10-5 show the loadings of each of the questions on the five Varimax factors (labelled 1 to 5), absolute loadings of greater than 0.2 being arbitrarily labelled as 'significant' to assist in factor identification.

The identification and naming of factors.

Despite reification, the naming of factors, being the most difficult part of factor analysis, often not being carried out with any degree of total certainty, names for factors are nevertheless necessary in order to allow theoretical prediction and conceptual understanding, as well as for ease of handling, and as long as their provisional and perhaps uncertain nature is accepted, should not be unduly misleading.

Factor 3 is the easiest to identify. It loads most heavily on the travel items and has almost no loadings on the items in the other tables. It may therefore be called Travel Of interest is that it loads primarily on European countries and North America. The countries of Africa, Asia and South America show poor loadings, perhaps because travel to these places is not so easy, and is often undertaken through necessity rather than choice (e.g. to visit parents or other relatives, or perhaps for elective study). The intermediate status of Russia, which is becoming more accessible for tourism, perhaps confirms this view. A

number of studies have attempted to classify motives, reasons and effects of foreign travel as a multi-dimensional scheme (see Pearce, 1982). Two major dimensions, of the traveller as 'exploitative or non-exploitative' and as being 'low contact or high contact with local culture' emerge fairly readily. It is possible that a more detailed analysis of the present type of data might also reveal separate dimensions within the overall pattern of foreign travel.

Factors 1 and 2 both show large numbers of loadings on the literary questions, although their patterns are different. Factor 1 contains more properly literary and cultural references (particularly in the non-fiction section), while factor 2 contains many more popular items, or items which are readily available (for instance, on 'railway bookstalls' rather than in specialist bookshops; for an historical perspective see Williams (1961; p.55)). The discrepancies between Erich von Daeniken and Desmond Morris on the one hand, and Galbraith, Gombrich and Popper on the other show this difference well. Of interest in the other tables is that factor 2 also loads heavily with reading many books, particularly fiction, whereas no such relation is found for factor 1 (see table 10-1); the emphasis in factor 1 is on quality rather than quantity. Other activities discriminate relatively poorly between the factors, with the exception of newspaper reading, where factor 1 loads positively on 'The Guardian' and negatively on 'The Daily Telegraph', whereas factor 2 shows no such relationship. Factor 1 also loads more heavily on the more literary weeklies such as 'New Society' and 'The Listener'. As a result of these correlations factor 1 is named Literary Culture, whilst factor 2 is named, perhaps a little contentiously, Low-brow Culture (although it may be noted that DiMaggio, 1982, referred to a 'Middle-Brow' factor).

Factor 4 is a very mixed factor. On the activities it shows high loadings for playing and watching sport, for watching television, and going to the pub, going to pop concerts, cinema and parties. High loadings on the newspaper items are found with all the tabloids, and none of the others (with the curious exception of the 'Morning Star' which, as stated earlier, might perhaps have been confused with 'The Star', itself a tabloid). Those few authors who show specific loadings on factor 4 tend to appeal explicitly to the lower end of the popular market (Frederick Forsythe, Harold Robbins, Erich von Daeniken, and, perhaps, Isaac Asimov). In view of the extremely populist aspects of most of these loadings it is probably fair to call this factor <u>Popular Culture,</u> in the sense that it contains many of the most frequent activities of the great majority of the population. It could with some justification also have been called 'working-class culture' in contradistinction to the primarily 'middle-class' content of the items included in the other factors, and following on Williams' (1963; p.313) description of working class culture as "primarily social rather than individual" (see also Hoggart, 1957).

Factor 5 is a compound of several types of item. An interest in playing music is coupled with attendance at opera, ballet and classical concerts. However the other items are not obviously related to music; attendance at art-galleries and museums, reading of both fiction and non-fiction, and spending time on hobbies are also noteworthy. Newspaper reading seems primarily to consist of the three 'serious' dailies, coupled with all three of the weeklies, including the scientific weekly. However the authors show few obvious loadings, and there is no relation to travel. This factor therefore seems to be <u>Non-literary culture.</u> It is possible that a more detailed analysis would separate these items into musical, artistic and other interests.

A General cultural factor.

Analysis of the eigen-values of the correlation matrix suggested that the first factor was of greater importance than the others. It is therefore of interest to ask whether a single factor might represent a common component though all the five factors thus far described. This single factor alone, which will be called C, was extracted by a principal factoranalysis, and factor scores for individual subjects were calculated for factor C and for the five Varimax factors. The correlation of C with factors 1 to 5 was .760, .626, .438, -.099 and .201 respectively. These results suggest that a single dimension of 'culture' can be extracted if required, and that this is dominated by literary culture in the form of factors 1 and 2, and has lower loadings on travel and non- literary culture, while factor 4, popular culture, shows, as might be expected, a negative loading on C.

Test-Retest Correlations.

The Birmingham study re-assessed some of the students after an interval of from one to five years. Table 10-6 shows the test-retest correlations of these subjects on the five Varimax factors, and on C. The overall correlations range between .700 and .815, which suggests that reliable factors are being measured. Factors 4 and 5, popular culture and non-literary culture, show significant downward trends in the test-retest correlation on the interval between tests, suggesting that these scales might be assessing factors which are more like state measures than trait measures.

"A sociological discussion of culture in liberal society must begin with the life of those who create culture, i.e. the intelligentsia" (Karl Mannheim, cited by Eliot, 1962, p.37). Whilst the medical profession is generally a part of the intelligentsia, Eliot is quick to point out that mere specialism is not sufficient to guarantee culture; indeed, "a very large number of members of these classes always have been conspicuously deficient in 'culture'" (Eliot, 1962, p.42), a point recognised by Flexner (1925; p.86). To explain this apparent paradox requires that we assess individual differences in cultural life, and observe whether they are responsible for other differences in behaviour. Whilst not denying Eliot's further dictum that "culture is not merely the sum of several activities, but a <u>way of life</u>" (Eliot, 1962, p.41, emphasis in original), we may also follow up his analysis of one of the meanings of culture, and extrapolate it to a method of measurement:

> "We may be thinking of refinement of manners - of <u>urbanity</u>
> and <u>civility</u> .. We may be thinking of <u>learning</u> and a close
> acquaintance with the accumulated wisdom of the past ... We
> may be thinking of <u>philosophy</u> in the widest sense - an interest
> in, and some ability to manipulate, abstract ideas ... Or we may
> be thinking of the arts ..." (Eliot, 1962, pp22-23).

However, "no perfection in any one of them, to the exclusion of the others, can confer culture on anybody" (Eliot, 1962, p.23). A related concept may be found in Jay (1984; p.112): "Elitist ... culture is identified with art, philosophy, literature, scholarship, theatre, etc., the allegedly 'humanising pursuits' of the 'cultivated' man. As a surrogate for religion ... [it is] the repository of man's most noble accomplishments and highest values, often in tension with either 'popular' or 'folk' culture". It would seem therefore that any

operational definition of culture must be as broad as possible in its inclusion of the multitudinous facets of cultural life, and must emphasise the reception of culture rather than the more conventional area of sociological interest of the production of culture (e.g. Williams, 1981, p.30). This questionnaire survey has deliberately attempted to widen the range of items as far as possible. It may be felt that we have overly emphasised books and reading, and a few words of justification are necessary. Morgan and Leahy (1934) have shown clearly that the cultural content of general interest reading can be easily and reliably differentiated, thereby making such items an obvious basis for a cultural scale, and Rowntree and Lavers (1951; p.286) suggested that "reading habits have a double significance, for what a man reads not only reveals his present intellectual and cultural standards, but also helps to determine what they will be in the future". Moreover, books are an important surrogate for more direct experience; to quote Eliot once more, "our development depends upon the people whom we meet in our lives. (These people include the authors whose books we read, and characters in works of fiction and history) ... We read many books because we cannot know enough people " (Eliot, 1962, pp. 59 and 86). To paraphrase an old saying, one may know a man by the company he keeps on his bookshelves; or as Cronin (1973; p.9) put it in his biography of Napoleon; "[he] was, among other things, a bookworm ... and we know exactly which books and plays moved him. These I discuss in some detail, believing that, like dreams, they throw light on his longings and fears". It should also be noted that in assessing the reading habits of the students in this study the emphasis has been on the type of books that is read, rather than as in the studies of Mann (1974) and Mann and Burgoyne (1969), which tend to concentrate on the quantity of books read. In selecting the authors to include in the questionnaire it is hoped to have avoided, as

far as possible, the Whiggish fallacy described by Williams (1963; p.297); "in judging ... culture, it is not enough to concentrate on habits which coincide with those of the observer". Nevertheless it is necessarily true that no authors have been included of whom the questionnaire compilers were unaware, and in that sense the choices are parochial. In general the study looks at the underlined details of cultural activities rather than taking the approaches of Neulinger (1974), Parker (1976), and Wilson (1980), which tend to concentrate on the quantity of leisure activity in general rather than upon its detailed structure, or the approach of Lueschen (1980) who emphasises just one specific subset of the broad sense of culture, namely sports.

The method of assessing culture has differed from that adopted by two other writers, Richmond (1964) and Montagu (1958), both of whom present a series of general knowledge questions from which a 'cultural score' or 'culture quotient' is derived. An objection to such an approach is that it tends only to reflect items which are learnt (and may perhaps only be reflecting past education, or even indoctrination), rather than reflecting the active, dynamic interests of a person; present enthusiasms may therefore be submerged under the weight of past educational accomplishment, thereby giving little potential for measuring change.

The present method, although it is a questionnaire, retains the ability to ask an individual how he chooses to relate to the culture of which he is a part; to ask which activities he wishes to share in, and which he wishes to reject; to ask what he wishes to know more about and what he finds uninteresting. In so doing the five scales derived retain sufficient complexity that the subtlety of the phenomenon is retained but it is rendered in a form in which it becomes analytically tractable in an

empirical manner.

That a single dimension may be extracted which loads on all five Varimax factors supports those theorists who have argued for the existence of a global entity which distinguishes between individuals who are more cultured and those who are less cultured (e.g. Leavis, 1972; pp88-89; Cowell, 1959, pp 230-233; Williams, 1963, p124).

A difficulty in assessing culture is whether it should be a state or a trait measure. In so far as it can be conceived of as a trait-like attitude of mind ("Culture is what is left after you have forgotten all you have definitely set out to learn", Powys, 1930, p.11), it is also a dynamic, state measure. Measures such as past reading experience tend to be cumulative across life, and hence one would expect older individuals to have higher scores than younger ones. Other measures, such as playing musical instruments, are dynamically changing, in that a person may take up or abandon his pursuit, and hence change is far easier to assess. For such reasons we might expect factors 4 and 5 to be temporally more labile than factors 1 to 3. Nevertheless even with purely cumulative measures, such as those based on reading, it is still the case that if an individual suddenly stopped reading, while his age peers continued to read new works at a constant rate, then the rank ordering of the individual could only fall. Hence changes in such measures are indicative of changes in cultural habits since previous assessment.

John Cowper Powys recognised the difficulties of attempting to define (and hence implicitly, to measure) culture. Nevertheless, he suggested that "approaching the subject first from one angle and then from another ... may bring the problem into regions of concrete experience such as would be impossible of attainment even by the most carefully worded theory" (Powys, 1930, p.11).

Table 10-1: Estimate how many hours per week you devote to the following activities:

	N	0 (1)	1-2 (2)	3 - 4 (3)1	5-8 (4)	8-15 (5)	15+ (6)	Trend by year	factor loadings 1	2	3	4	5
Watching television	1498	11.9	21.7	26.88	25.5	11.9	2.3	- - - -.13		13	-.08	.21	.01
Playing sport	1498	17.0	32.0	24:1	19.0	5.9	2.0	-	-.23	.17	.08	.25	.02
In a pub	1498	26.2	28.0	20.8	18.9	6.3	1.7	NS	.05	.11	.14	.40	-.20
On hobbies	1498	13.8	19.4	30.8	21.6	11.1	3.5	NS	.02	.03	.03	-.04	-.29

Do you play sport for a team?

	N	No (1)	Yes (2)				Trend	1	2	3	4	5
	1396	82.4	37.6				- - -	-.21	-.13	.01	.24	-.01

Do you play any musical instrunents?

	N	Not at ell (1)	Slightly (2)	Adequ- ately (3)	Well (e.g. piano grade V) (4)		Trend	1	2	3	4	5
	1498	35.4	23.2	16.4	25.0		NS	-.01	-.04	.07	-.29	.28

Estimate how many times per year you attend the following:

	N	0 (1)	1-2 (2)	2-5 (3)	6-10 (4)	10+ (5)	Trend	1	2	3	4	5
							+ + +				-.13	.26
Theatre	1509	18.0	35.7	30.6	11.1	4.6		.20	.27	.23		
Opera	1509	77.0	18.6	3.5	0.5	0.3	+	.12	.04	.14	-.24	.31
Ballet	1509	78.1	19.4	1.9	0.4	0.1	+ + +	.15	.11	.13	-.28	.32
Pop concerts	1509	38.8	29.8	22.8	6.9	3.7	NS	.02	.19	.14	.36	-.08
Classical concerts	1509	44.5	29.8	16.8	5.2	3.7	+ + +	.15	.12	.18	-.33	.35
Art galleries	1509	31.9	42.7	18.4	4.8	2.3	+ +	.25	.27	.27	-.06	.29
Museums	1509	14.3	49.5	27.1	6.2	2.9	(+)	.08	.20	.18	.00	.34
Cinema	1509	5.1	15.6	37.3	24.1	18.0	+ + +	.08	.22	.17	.22	.00
Football matches	1509	68.7	15.8	7.1	3.5	5.0	NS	-.11	.06	.05	.31	-.11
Cricket matches	1509	86.9	18.7	8.9	2.5	3.0	- -	-.11	.15	.06	.28	.04
Parties	1509	3.0	7.6	20.9	24.3	44.3	+ + +	.01	.26	.23	.29	-.01

Estimate how many non-medical,non-school books you read per year:

	N	0 (1)	1-5 (2)	6-10 (3)	11-20 (4)	21-50 (5)	504- (6)	Trend	1	2	3	4	5
								NS	.07	.57	-.01	-.01	
Fiction	1509	3.0	29.5	24.9	20.4	18.5	5.7						.31
Non-fiction	1509	5.3	51.0	23.8	13.9	4.3	1.7	(-)	.05	.31	-.09	.07	.41

Table 10-2: How often do you read the following newspapers or journals?

	N	Never	Rarely	Moderately often	Usually	Trend by year	factor loadings				
							1	2	3	4	5
		(1)	(2)	(3)	(4)						
Daily Express	1458	28.6	45.7	18.2	7.4	-	-.14	-.01	-.04	.39	.12
Daily Mail	1455	26.3	42.5	21.6	9.6	NS	-.07	-.03	-.03	.33	-.06
Daily Mirror	1441	39.4	45.2	12.6	2.7	+ + +	.05	-.06	-.05	.57	.05
Daily Telegraph	1475	16.8	30.4	26.3	26.5	[-]	-.21	.15	.04	.09	.18
The Guardian	1454	28.0	34.7	24.0	13.3	+ + +	.25	.11	.14	.11	.21
Morning Star	1436	89.6	9.7	0.4	0.3	NS	.18	-.04	.02	.24	.08
The Star	317	82.6	15.1	1.9	0.3	N/A	.11	-.03	-.02	.47	.08
The Sun	1452	49.2	37.5	11.9	1.4	+	.04	-.07	.01	.58	-.05
The Times	1459	15.1	37.1	30.6	17.1	+ + +	.07	.19	.21	.04	.22
Local Newspaper	1489	7.4	18.6	37.4	36.7	- - -	-.10	-.06	-.11	.19	.22
New Society	319	80.9	14.7	2.5	1.9	N/A	.42	-.11	.07	.08	.43
The Listener	323	59.8	27.6	9.0	3.7	N/A	.26	-.01	.03	.16	.49
New Scientist	1463	24.3	35.5	26.4	13.8	- - -	.00	.00	-.12	.05	.47

Table 10-3: How many works have you reed by the following authors? (Fiction).

						factor loading				
	N	None	One	More	Trend	1	2	3	4	5
				than one	by year					
		(1)	(2)	(3)						
Isaac Asimov	1501	50.6	16.9	32.5	NS	.12	.29	-.02	.19	.01
Jane Austen	1501	45.3	25.1	29.6	+ +	.19	.29	.00	-.28	.28
Albert Camus	1501	79.8	11.8	8.4	+ + +	.44	.31	.15	-.11	-.06
Dostoievsky	1501	83.5	11.2	5.3	+ + +	.49	.29	.11	-.13	.03
Margaret Drabble	1501	88.5	6.1	5.4	+ + +	.29	.17	.06	-.07	.10
George Eliot	1501	64.5	22.7	12.9	+ + +	.19	.28	.06	-.16	.21
Frederick Forsythe	1501	59.8	12.5	27.7	+	-.02	.35	.11	.20	-.01
Guenther Grass	1501	92.5	5.1	2.3	+ + +	.36	.24	.12	-.02	-.06
Graham Greene	1501	37.9	26.5	35.6	+ + +	.21	.47	.10	.01	.01
Hermann Hesse	1501	81.7	9.3	9.0	+ + +	.47	.29	.11	-.08	-.12
Aldous Huxley	1501	46.0	29.9	24.1	+ + +	.32	.44	.10	.01	.03
James Joyce	1501	75.8	16.7	7.5	+ + +	.40	.3 4	.09	.01	.06
D.H. Lawrence	1501	36.0	28.4	35.6	+ + +	.17	.42	.11	-.07	.14
Doris Leasing	1501	95.0	2.7	2.3	+ +	.33	.15	.04	-.06	-.03
Christopher Marlowe	1501	91.3	8.5	2.2	+ +	.21	.25	.05	.04	.07
Maupassant	1501	87.1	7.7	5.2	+	.31	.15	.06	-.09	.07
George Orwell	1501	13.3	22.5	64.2	+ + +	.13	.43	.11	.01	.01
Harold Robbins	1501	77.1	12.9	10.0	+	.02	.32	.02	.20	.00
John Steinbeck	1501	51.3	22.0	26.7	+ + +	.21	.45	.07	-.02	-.04
Solzhenitsyn	1501	50.4	23.0	26.6	+ + +	.28	.44	.12	-.03	.00
Stendhal	1501	98.5	0.9	0.6	NS	.27	.06	.04	-.07	.01
Tolstoy	1501	69.1	20.2	10.7	+ + +	28	.38	.10	-.14	.14
Leon Uris	1501	82.1	8.7	8.2	+ + +	.18	.24	.09	.03	.08
Virginia Woolf	1501	84.4	11.2	4.4	+	.35	24	.09	-.07	.13

Table 10-4: How many books have you read by the following authors? (Non-fiction)

	N	None	One	More than one	Trend by year	------factor loadings				
						1	2	3	4	5
		(1)	(2)	(3)						
					+ +					
Edward de Bono	1501	89.1	8.0	2.9		.38	.13	.00	.02	.05
Erich von Daeniken	1501	67.8	18.9	13.3	NS	.03	.21	-.03	.22	.03
Charles Darwin	1501	60.4	33.8	5.9	(+)	.03	.16	.04	.10	.28
Eysenck	1501	86.3	9.1	4.6	+ + +	34	.14	.03	.05	.33
Freud	1501	83.5	12.7	3.8	+ + +	.32	.19	.11	.07	.39
Galbraith	1501	96.0	3.1	0.9	+ + +	.43	.08	.05	.01	.00
Illich	1501	94.7	3.9	1.4	+ + +	.47	.06	.07	-.01	-.04
R.D. Laing	1501	90.9	6.1	3.1	+ + +	.49	.15	.11	-.02	-.03
C.S. Lewis	1501	36.1	15.8	48.1	+	.02	.35	.06	-.19	.10
Marx	1501	89.5	9.3	1.3	+ + +	.26	.22	.11	.09	.08
John Stuart Mill	1501	97.0	2.3	0.7	+	.43	-.01	.07	.04	.12
Desmond Morris	1501	57.9	24.2	17.9	+ + +	.17	.29	.11	.12	.04
Karl Popper	1501	95.7	3.7	0.7	(+)	.40	-.01	.06	.02	.10
E.F. Schumacher	1501	95.8	4.1	0.3	NS	.30	.07	.07	-.02	.09
Lyall Watson	1501	90.7	5.9	3.3	NS	.19	.08	.02	.02	.07
Gombrich	1501	98.3	1.5	0.2	+ +	.27	.01	.05	-.09	.05

Table 10-5: Which of the following areas have you visited? Exclude areas you have only passed through.

	N	Never (1)	Once only (2)	More than once (3)	Trend by year	1	2	3	4	5
France	1496	25.2	23.3	51.5	+ + +	.02	.11	.52	−.08	.05
Germany	1496	53.8	27.0	19.2	+ + +	.03	.06	.57	.01	.00
Italy	1496	53.7	26.8	19.5	+ + +	.07	.07	.59	.01	.01
Switzerland	1496	63.1	22.3	14.8	+ + +	.01	.12	.60	−.02	−.02
Holland	1496	69.8	21.3	9.1	+ + +	.04	.05	.51	.03	−.01
Belgium	1496	68.0	19.9	12.1	+ + +	.01	.05	.56	.10	.07
Spain	1496	62.2	19.5	18.4	(+)	−.01	.05	37	.02	.02
Portugal	1496	90.4	8.8	2.8	NS	.05	.05	.28	−.02	.05
Greece	1496	77.4	17.1	5.5	+ + +	.17	.04	.44	.02	−.02
Scandinavia	1496	85.2	9.4	5.3	+ + +	.09	−.01	.31	−.04	.02
Eastern Europe	1498	86.0	10.6	3.3	+ +	.06	−.01	.40	.03	.04
Middle East / North Africa	1 498	83.4	11.8	5.1	+ +	.10	.05	.26	−.01	−.02
Central / Southern Africa	1496	93.5	3.1	3.3	(+) NS	.10	.02	.07	−.03	.04
India / Far East	1496	90.3	5.2	4.5	NS	.12	−.01	.17	.02	.06
Russia / China	1496	97.0	2.7	0.3	NS	.12	−.01	.17	.02	.06
Australasia	1496	98.8	1.9	1.3	+	.03	.08	.09	−.01	.01
North America	1496	79.4	13.8	8.8	+ +	.10	.08	.20	−.02	.01
South America	1496	97.9	1.6	0.5	NS	.05	.07	.07	.01	.04

Table 10-6: Shows the test-retest correlation for subjects tested at ntervals of from one to four years.

			Test-retest interval			
	All subjects 190	One year 51	Two 47	Three 59	Four years 33	Sig. of trend
Factor						
	.795	.815	.762	.813	.794	NS
	.700	.802	.482	.728	.605	NS
	.764	.851	.786	.711	.906	NS
	.717	.589	.649	.683	.549	**
	.725	.885	.739	.614	.620	**
	.815	.910	.730	.770	.835	NS

11: The culture of medical students: correlates and changes.

"He complained that the young medical men were uneducated; their reading consisted of The Sporting Times and the British Medical Journal"

Somerset Maugham, <u>Of</u> <u>Human Bondage.</u>

"Medical education consists not merely in the acquirement of scientific and clinical knowledge, but in the general cultural development of the mind and physical development of the body".

Zachary Cope, <u>The</u> <u>History</u> of <u>St</u>. <u>Mary's Hospital Medical School.</u>

Summary.

The correlations of five measures of culture with a number of social and educational background factors, and with the Eysenck Personality Questionnaire are described in the St. Mary's study of applicants to medical school. In the Birmingham study the cross-sequential design is used to study change in culture as a function of age, years in medical school, and cohort of entry.

In the previous chapter the development of a set of scales for measuring the cultural behaviour of medical students has been described. Factor analysis of the responses to ninety separate questions on a questionnaire, derived five orthogonal factors and a single higher-order factor, a brief summary of which is given below. The factors were named as followed :-

1. Literary Culture. This factor loaded heavily on quality books, particularly non-fiction of a philosophical nature.

2. Low-Brow Culture. This factor loaded more heavily on lighter novels and hardly at all on non-fiction books, except for a few more popular authors. It tended also to relate to the quantity of reading rather than the quality. It could perhaps be summarised as 'Railway-bookstall reading'.

3. Travel. This factor loaded only on travel items, and in particular on places for which travel might be described as recreational' rather than functional; i.e. the countries of Europe and of North America, and excluding most of the Third World, which countries had far lower loadings.

4. Popular culture. This factor has strongest loadings on sporting activities, watching television, going to a pub, football and cricket matches and parties, and cinema and pop concerts. The tabloid newspapers have high loadings. The few authors with positive loadings are unashamedly at the lower end of the market.

5. Non-literary culture. High loadings indicate a high proportion of time spent on hobbies, in particular music. High scorers are more likely to attend theatre, opera,

ballet, classical music concerts, art galleries and museums, and are more likely to read the weekly magazines.

C: 'Culture'. Factor C is a higher-order factor which accounts for 42.7% of the common variance in factors 1 to 5, and has positive correlations with all factors except factor 4, for which there is a negative correlation. The factor broadly assesses culture in all its manifestations.

Scores were calculated for each subject on each factor by the SPSS FACTOR program (Nie et al, 1975), the scores being approximately normally distributed with a mean of zero and variance of unity when considered across all subjects in the original sample. In general there have been almost no studies of the cultural pursuits of doctors, with the exception of brief anecdotes. The only relevant study in an allied profession is that of Borkman et al (1981), in their study of the 'recreational and community' activities of US dentists. Their conclusion, of an "overwhelming preference for sports and physical activities in comparison with intellectual, cultural or artistic hobbies" sounds as if it might be broadly appropriate for the conventional stereotype of medical students, although their study was not particularly sophisticated and may well have missed many cultural activities.

In the present chapter it will be asked how background social factors relate to culture scores, how personality correlates with culture, and how culture scores change as individuals pass through medical school.

<u>Background correlates of culture scores.</u>

The St. Mary's **study was** used to examine the relation of background variables, including selection itself, to the culture factors. The analysis is therefore an extension of that reported in chapter 6.

<u>Method.</u>

Table 11-2 summarises all of the variables which were felt to be of interest. The variables of table 11-2 are often inter-correlated (for instance coming from a medical family correlates with high social class and attending private sector schools). Relations of the culture scores to background factors were therefore examined by a hierarchical multiple regression technique, using the NEW REGRESSION package of the SPSS program suite (Hull and Nie, 1981), in which at each step of the analysis that variable was entered which increased the multiple correlation by the greatest amount, the contributions of all previously entered variables having been taken into account. The analysis continued until no additional variable could produce a significant improvement in the multiple correlation at the 0.05 level.

<u>Results.</u>

Table 11-1 shows, for each of the five orthogonal factors, and the higher-order factor, C, the results of a hierarchical multiple regression on the background variables of table 9-1. In all cases a highly significant multiple regression is found (p<0.001 in all cases). For each variable in each analysis is shown the order of entry into the analysis, the significance of the improvement in fit as a result of the entry of that variable, and the beta coefficient in the final regression

equation.

From table 11-1 **it can be seen** that cultural factors differ in their pattern of correlations with background variables. Thus social class manifests only on factor 3, Travel, while a private sector education seems only to relate to factor 1, Literary culture. Female applicants score more highly on factors 1, 5 and C, score less on factor 4, and show no differences on factors 2 and 3. Older applicants score more highly on factors 1,2,3 and C, but not on factors 4 and 5. Factor C has the largest number of correlates, reflecting its relation to all of the five orthogonal factors.

In general the background factors account for between 9 and 29% of the total variance in culture scores between individuals.

Discussion: Background correlates of culture scores.

The pattern of correlations of each of the culture scales with the background factors is different, suggesting that separate causal mechanisms are in operation. Social class might be expected to have a dominant effect upon culture, although that its effects appear relatively small in the present study could be a result of the rather restricted social composition of the group (chapter 3). Social class has its clearest effects on Travel, which effects are probably a simple result of differences in income. Of other obvious correlates of social class, a private sector education (i.e. the applicant has attended a 'public' school) relates only to factor 1, Literary culture; this could either be due to the specific teaching of these schools, or alternatively could be a result of the leisure habits of those students who are boarders, the long evenings being whiled away in reading (and indeed there is a

tendency for those **prvate sector** students who have been boarders to have a higher score in factor I (n=52; mean=0.271) than those who have not been boarders (n=108; mean=.071; t=1.62; p=.054, one-tailed)). Other schooling factors have relatively little influence upon culture, the single exception being that those applicants from sixth forms which send a greater proportion of students to university tend to be more cultured in general. These results are in clear contrast to the effects of schools upon attitudes, which are more extensive (chapter 9). Scores show some relation to the 0- and A-level results of applicants, although the pattern is not easily interpretable. Differences between the sexes are large, and not particularly unexpected, particularly for factors 4 and 5. The manner of application of the students to medical school shows some correlation with culture, those who have placed less medical schools on their UCCA form (i.e. they have made some non-medical choices) tending to score more highly on Literary culture and on the general culture scale. That medical schools tend preferentially to select students who have made all their choices for medicine might result in an intake with lesser general cultural interests. Those applicants not accepted by any medical school tended to have higher scores on factors 5 and C; this is difficult to interpret but might suggest that schools tend to select narrower specialists rather than generalists. Finally, an important correlate on factors 1, 2, 3 and C is the age of the applicant, older, more mature applicants scoring more highly. To a large extent such correlations simply reveal that the culture scores have a large cumulative component within them. That point will be considered further in the next discussion section.

<u>Changes in culture scores.</u>

Culture may change as students pass through medical school, either as a result of the direct influence of the medical school (and of its sub-cultural 'ethos') or as a consequence of the process of student maturation, since students also grow older as they pass though the medical school. In addition transverse studies of students might be confounded by long-term changes between cohorts of students. The second analysis, of students in the Birmingham study, studied the effects of these factors in a similar manner to that described in chapter 9 for ethical attitudes.

The study used a modified cross-sequential design (Schaie, 1965) in which students in all the five years of the medical school were assessed in October 1977. First year students were then assessed in October 1978, 1979 and 1980, and then in October 1981 a second transverse study of students in all the five years was carried out. Following the advice of Baltes et al (1977) the separate effects of year of medical school study and cohort of entry have been studied, since the main interest is in ontogenesis (and thus the year of testing effects have been ignored). Year of medical school confounds the number of years the student has spent in the medical school with his age; however since these two items are not perfectly correlated it is possible to enter both into the model and thereby examine the independent effects of each explanatory variable.

Method.

Statistical analysis for significance of effects was by means of the SPSS ANOVA program (Nie et al, 1975; Hull and Nie, 1981). Effects of age (A), years in medical school (M), and cohort of entry (C) were examined. In order to test the effect of A a main-effects model was fitted as the first stage of the analysis, all possible levels of M and C being represented by dummy variables. At the next stage the linear component of A was added to the model and its significance assessed by the improvement in the fit of the model. Non-linear trends were examined in the third stage by simultaneously adding into the model the quadratic, cubic, quartic and quintic effects of A and examining the improvement in the goodness of fit of the model. Similar procedures were used to test the independent effects of M and C.

In view of the multicollinearity of A, M and C, estimates of effect sizes were obtained by the method of ridge regression (Price, 1977). A main effects model of A, M and X was fitted in which each level of each explanatory variable was represented by a dummy variable. Empirically it was found that a value of K of 0.345 reduced the mean variance inflation factor to unity, and this value was used in computing the ridge regression estimates for each of the dummy variables.

Results.

Figure 11-1 shows the ridge estimates of effects for each of the five orthogonal variables and the higher-order factor, C, for the independent effects of age, years in medical school and cohort of entry. The significance of linear trends is indicated alongside each of the graphs by asterisks. Unless otherwise stated in the text, non-linear

effects are non-significant.

Factor 1: Literary culture. This factor shows a slight increase with years in medical school, and shows no significant relation to age or cohort.

Factor 2: Low-brow culture. This factor shows a highly significant increase with age, both linear ($p<0.001$) and non-linear ($p<0.001$), the latter implying curvilinearity in the relationship. There is no effect of years in medical school, but there is a significant downwards trend with cohort of entry, more recent entrants having lower scores.

Factor 3: Travel. This shows significant increases with both age (linear: $p<0.001$; non-linear: $p<0.05$) and with years in medical school (linear $p<0.05$; non-linear: not significant).   There is no cohort effect.

Factor 4: Popular culture. This factor shows no independent relations to age, years in medical school or cohort of entry.

Factor 5: Non-literary culture. This factor shows a significant linear downwards trend with age, and no relationship to years in medical school or cohort of entry.

Factor C: 'Culture'. This factor shows a highly significant effect of age (Linear: $p<0.001$; non-linear: $p<0.001$) and a linear effect of years in medical school ($p<0.05$), with no effects of cohort.

It thus seems that age has the largest effects upon cultural behaviour, most factors increasing with age, although non-literary culture shows a decline, and factors 1 and 4 shows no significant change with age. Medical schooling does have some independent effects upon cultural behaviour, in particular on factors 1, 3 and C, although none of the effects achieve very high levels of significance. Cohort effects are seen only in factor 2, Low-Brow culture, those students entering towards the end of the period 1973-1981 tending to have lower scores.

Multiple correlations **of** the five orthogonal factors and of C with age, years of medical schooling and cohort were .256 (p<.001), .411 (p<.001), .309 (p<.001), .142 (NS), .247 (p<.001) and .382 (p<.001) respectively. Thus these three explanatory variables could account for between 6.1% and 16.9% of the total variance in factors 1, 2, 3, 5 and C. Factor 4 showed no evidence of a relationship to the explanatory variables.

Discussion: changes in culture scores.

The behaviour of medical students may change as they pass through medical school either because they are being influenced by the university and its cultural milieu, or simply because they are growing older. The results shown above sugest that both processes are occurring. Both age and years at medical school have independent significant effects upon the general cultural factor, C. For the more specific orthogonal factors a different pattern emerges. Neither age nor year of study substantially affects the development of factors 4 and 5 (Popular culture and Non-literary culture). Both are, to a greater extent than some of the other scales, 'state' measures (see chapter 10) and thus are not embarrassed by the absence of a general increase. Factors 1, 2 and 3 are all cumulative (in that they integrate across all past behaviour), and all show substantial changes with age or years in medical school. Literary culture shows an effect only of years in medical school, suggesting that change is occurring as the result of being exposed to a university environment, rather than due to simple maturation. By contrast factor 2, Low-brow culture, shows a relation only to age, and not to year in medical school. Travel, factor 3, shows independent effects of both age and year in medical school.

The methodology used in this study also allows the detection of long-term cohort differences in entrants to medical school. Linear trends were only significant for factor 2, Low-Brow culture, which decreased over the period 1973-1981, although there were suggestive trends in several other factors. The reason for any such changes are not at all clear and would need to be extended by further study before explanations were attempted. A particular possibility with factor 2 is that a number of the authors considered are relatively ephemeral in their popularity and hence they had gone out of fashion by the time that more recent cohorts were entering the study. Such transient popular interests impose moderately severe methodological constraints on any study of culture.

Culture and Personality.

Cattell and Warburton (1967) have suggested that the assessment of 'High-brow tastes', 'Reading preferences', and 'Book preferences' may be regarded as an 'objective' test of the personality dimension of U.I. 16 ("Narcisstic ego vs secure, disciplined unassertiveness"). However Kline (1983) has pointed out that such a test has several criticisms; it is 'transparent', in that an individual might guess the nature of the scale being assessed, and it is patently not culture-free. Despite the criticism of such scales as personality assessments per se, there still remains the important question of whether cultural behaviour relates to personality in general.

<u>Method.</u>

The St. Mary's Study administered the EPQ (Eysenck Personality Questionnaire: Eysenck and Eysenck, 1975, 1976) to all interviewees immediately after they had been given questionnaire 2 (Q2) of that study, which contained culture and attitude scales.

<u>Results.</u>

The distributions of personality scores of the applicants have been described in chapter 6 and show that applicants have higher extraversion and lie scores, and lower neuroticism and psychoticism scores than the general population.

Table 11-2 shows Pearsonian correlation coefficients between the four personality dimensions (E: Extraversion; N: Neuroticism; P: Psychoticism; and L: Lie) and the five orthogonal culture scores and the general cultural factor.

Extraversion shows significant positive correlations with cultural factors 1, 3, 4, 5 and C. Neuroticism shows no correlations with any of the cultural factors. Psychoticism shows positive correlations with factors 1 and 4 and a negative correlation with factor 5. The Lie scale shows negative correlations with factors 1, 3, 4 and C.

<u>Discussion: Culture and Personality.</u>

From table 11-2 it is clear that the five orthogonal culture scores each tends to show a specific pattern of correlation with the four personality scores. Four of the five orthogonal factors show correlations with extraversion, as does the overall scale, C. These

results provide no support for the popular view of the 'bookish' person as introverted and withdrawn. Neuroticism shows no relation to any of the cultural scales, which is perhaps at odds with the popular image of the cultivator of the arts as an overly sensitive individual.

The most difficult personality dimensions to interpret are psychoticism and the lie scale. Psychoticism shows the strongest relation to popular culture, which is consistent with the mildly psychopathic behaviour frequently associated with drinking and sport (at least in medical student sub-culture). The correlation with literary culture is obscure, but could conceivably be interpreted as a preference for books rather than for people. The negative association of psychoticism with non-literary culture may be due to factor 5 containing an emphasis on cultural <u>production</u> of music and other arts (rather than just their passive reception), and for this a greater degree of stability (and hence lower psychoticism scores) may be beneficial. A further difficulty in interpretation of the correlates with psychoticism is that the underlying structure of extraversion and psychoticism in the Eysenckian schema appears to be changing (See McManus and Weeks, 1982; McManus, 1983), such that items which in previous versions of the Eysencks' scales would have been scored as extraversion (to do with impulsivity) are now included in the psychoticism scale, and extraversion has become a purer measure of sociability.

That the lie scale shows correlations with three of the five orthogonal scales and with the general scale might at first sight suggest that the culture scales are simply unreliable or subject to social biasses, due to dissembling by the applicants. However that interpretation must be rejected since in all cases the correlations are negative;   that is, those with the highest lie scores report the least

degree of involvement with those activities for which there is maximum social kudos. It is of course possible that, at the time of their interview, these prospective students perceive the dominant ethos of the medical school as anti-cultural, but this would be inconsistent with the medical school prospectus, which stresses extra-curricular activities, and with the measured attitudes of the students as a whole, who rate St. Mary's most highly of all schools in extra-curricular activities (Wakeford, 1983). Finally, it would seem that if mere social acquiescence in the perceived norm were the reason for these correlations, then factors 2 and 5 would also show such correlations, but there is in fact no evidence for such relations. Perhaps the best interpretation is to follow Crookes and Buckley (1976), Kirton (1977), Massey (1980) and Eysenck and Eysenck (1976: pp 160 - 170) and accept that the the L scale is more interesting than being simply a measure of a tendency to distort the responses to questions in response to perceived norms, but is rather an independent measure of personality in its own right, high scorers perhaps not being regarded as dissemblers but as "lacking insight or self-awareness", "inaccurate, uninsightful but honest self-assessers", or "conformists". Certainly any of these views would be compatible with the negative correlations between the L scale and the culture scores, and would suggest that the L scale should have its own predictive correlates with behaviour. A final, more tenuous, possibility is that the relation between culture and the L scale is indeed causal, but in the opposite direction to that implied in the above discussion, and that one of the effects of cultural activity is to encourage honesty in self-evaluation, and hence to produce lower L scores in those with greater cultural activity.

The present results support Cattell and Warburton's contention that 'High-brow tastes' are related to personality assessment, although there is no evidence for the specific suggestion that the major correlate is a factor (U.I. 16) "expressing competitive striving for excellence in any performance" (Cattell and Kline, 1977), partly due to it not being at all clear how U.I.16 would emerge in the EPQ assessment. Furthermore as Cattell and Kline (1977) state, the suggestion that "vanity and competitiveness are the roots of high-brow factors in [their] American sample" may well be a result peculiar to American culture.

Discussion: General.

The correlations demonstrated in the present study with the cultural factors of chapter 10 suggest that the measurement of cultural behaviour is potentially a useful addition to the description of individual differences. That the five orthogonal cultural factors each tends to show a different pattern of correlates provides good support for their factor analytic separation. It is of course possible that a more extensive study would allow further factors to be identified.

The ability to measure the culture of individuals should allow more precise empirical study of suggestions that psychometric tests, particularly of intelligence, are 'culture-free', and should also be useful in the development of more general theories of cultural evolution (Cavalli-Sforza and Feldman, 1981) and of gene-culture co-evolution (Lumsden and Wilson, 1981). Cultural activity has also been credited with influencing the attitudes and the religious views of individuals, and these possibilities will be specifically considered in chapter 13.

<u>Figure 11-1.</u> Shows estimates of independent effects of age, year of study and cohort of entry to medical school for each of the five orthogonal cultural attitudes, and for the overall culture factor. Each individual graph shows the effect size as estimated from ridge regression coefficients (see text). Points are only plotted if at least 50 individuals contributed to the point. Sample sizes in the total sample are shown across the top of the columns. Significance levels for linear trends are indicated alongside data sets (*: p<0.05; **:p<0.01; ***: p<0.001; No indication: Not significant). The ordinate is in standard deviation units with respect to the entire reference population (see text). Since points within individual graphs are only plotted relative to one another the absolute position of individual graphs is arbitrary, and has been adjusted for display purposes.

1 Literary culture

2 Low-brow culture

3 Travel

4 Popular culture

5 Non-literary culture

C `Culture´

***

***

***

*

*

*

**

| 18 19 20 21 22 23 | 1 2 3 4 5 | 73 75 77 79 81 |
| Age | Year | Cohort |

Table 11-1: Shows hierarchical multiple regressions of the six culture factors. Descriptions of variables have been modified so that all beta coefficients are positive. N=312.

```
        Order
        of Entry              Variable                      Beta

Dependent variable = 1: Literary Culture.        Multiple R = .317

        1           Private sector education              .241   <.001
        2           Less medical schools on UCCA form     .141    .010
        3           Female applicant                      .129    .020
        4           Older applicant                       .128    .019

Dependent variable = 2: Low-Brow Culture.        Multiple R = .522

        1           Older applicant                       .276   <.001
        2           Less 0-levels taken                   .289   <.001
        3           Biology A-level not taken             .156    .001
        4           More A-levels taken                   .107    .032

Dependent variable = 3: Travel.                  Multiple R = .358

        1           Higher social class                   .253   <.001
        2           Mature applicant                      .170    .004
        3           Oxbridge applicant                    .202    .003
        4           Higher average A-level grade          .141    .012

Dependent variable = 4: Popular Culture.         Multiple R = .470

        1           Male applicant                        .469   <.001

Dependent variable = 5: Non-literary Culture.    Multiple R = .300

        1           Female applicant                      .285   <.001
        2           Not accepted for any medical school   .109    .045

Dependent variable = C: Overall culture.         Multiple R = .537

        1           Older age                             .329   <.001
        2           Higher social class                   .176   <.001
        3           Female applicant                      .161    .002
        4           Higher proportion of sixth form going
                    to university                         .176    .001
        5           Less 0-levels taken                   .164    .001
        6           Less medical schools on UCCA form     .137    .012
        7           Earlier UCCA application date         .153    .018
        8           Not accepted for any medical school   .117    .020
```

Table 11-2: Shows Pearsonian correlations between the four dimensions of the Eysencks' Personality Questionnaire and the five orthogonal measures of culture and the general 'Culture' factor, C. NS: Not significant; +: p<0.10; *: p<0.05; **:p<0.01; ***:p<0.001.

	E	N	P	L
1: Literary culture	.118 *	.007 NS	.115 NS	-.169 **
2: Low-brow culture	-.071 NS	.066 NS	.063 NS	-.051 NS
3: Travel	.196 ***	.012 NS	.037 NS	-.198 ***
4: Popular culture	.173 **	-.015 NS	.204 ***	-.198 ***
5: Non-literary culture	.122 *	-.019 NS	-.136 *	-.014 NS
C: 'Culture'	.134 *	.042 NS	.069 NS	-.199 ***

12: Religio medici: a study of medical students.

"Skilful men, of the medical and chirurgical profession, were of rare occurrence in [Puritan New England]. They seldom, it would appear, partook of the religious zeal that brought other emigrants across the Atlantic. In their researches into the human frame, it may be that the higher and more subtile faculties of such men were materialised, and that they lost the spiritual view of existence amidst the intricacies of that wondrous mechanism, which seemed to involve art enough to comprise all of life within itself."

Nathaniel Hawthorne, The Scarlet Letter.

"Science without religion is lame, religion without science is blind".

Albert Einstein.

Summary.

Religious behaviour has been studied in the St. Mary's and Birmingham studies of medical students. Evidence from a multiple regression suggests that the significant diminuition of religious behaviour as students pass though medical school (demonstrated both in transverse and longitudinal studies) is a consequence of maturation or ageing, rather than of the specific effects of medical education _per se_. The more religious students tended to be female, and to have higher L scores on the Eysenck Personality Questionnaire. There were no significant background predictors of religiosity, and neither was there evidence for cohort changes over the period 1973 - 1981.

Sir Thomas Browne commenced his essay <u>Religio Medici</u> with the comment that "there be several Circumstances that might perswade the World I have [no religion] at all", and includes in these circumstances, "the general scandal of my Profession [and] the natural course of my Studies". The present chapter considers the question of whether medical studies do indeed lead practitioners to an absence of religion. Received opinion certainly suggests that medicine and the absence of religious conviction are related. A Renaissance proverb stated that "Ubi tres medici, duo athei" (Where you find three doctors you will find two atheists), and Robert Southey commented that:

> "... Physicians as they grow
> greater in skill, grow less in their religion,
> attributing so much to natural causes
> that they have little faith in that they cannot
> deliver reason for."

In the mid-nineteenth century Cardinal Newman considered the relation between religion and education in general (and medical education specifically). He held two separate views; one pragmatic concerning the actual relationships between religion and education; the other idealistic concerning its possible relations.

That scientific training was perceived as a threat to religion was clear to him, at least on a psychological or sociological level: "The sciences ... are looked upon with anxiety, not altogether ungrounded, by religious men" <u>(Christianity and Scientific Investigation, p.412)</u>; "... religious men would not be ... jealous and alarmed about science, did they not feel instinctively, that knowledge is their born enemy ..." <u>(The Idea of a University, p.104)</u>.

Medical training in particular had this effect, since the particular experiences of the student might predispose him to a materialistic view of mankind;

> "A medical philosopher, who has so simply fixed his intellect on his own science as to have forgotten the existence of any other, will view man, who is the subject of his contemplation, as a being who has little more to do than to be born, to grow, to eat, to drink, to walk, to reproduce his kind, and to die. He sees him born as other animals are born; he sees life leave him, with all those phenomena of annihilation which accompany the death of a brute. He compares his structure, his organs, his functions, with those of other animals, and his own range of science leads to the discovery of no facts which are sufficient to convince him that there is any difference in kind between the human animal and them. His practice, then, is according to his facts and his theory. Such a person will think himself free to give advice, and to insist upon rules, which are quite insufferable to any religious mind, and simply antagonistic to faith and morals."

> (Christianity and Medical Science, p.459;
> in Newman, 1873).

To summarise, "[the doctor] might in process of time have become simply dead to all religious truths, because such truths were not present to him, and those of his own science were ever present" (ibid, p.458). The final result might be, "the especial temptation and danger to which the medical profession is exposed; it is a certain sophism of the intellect" (ibid, p.456). In essence this "radical sophism" views the only questions of import as being those with medical components or implications.

Thus far, therefore, Newman makes a strong psychological case for the prevalence of atheism amongst doctors, and it is that case which primarily concerns us here. However it is necessary in Newman's defence to emphasise that he did not feel that religion and medicine were necessarily alien, either in practise or in scientific study. "Bodily health is not the only end of man, and the medical science is not the highest science of which he is the subject. Man has a moral and a

religious nature, as well as a physical. ... as the soldier must yield to the statesman, so must the medical man to the priest." (Christianity and Medical Science, p.456). As far as science is concerned he tells us that "Revealed religion furnishes facts to other sciences, which other sciences, left to themselves, would never reach" (On the Scope and Nature of University Education, p.105 in Newman, 1873). Regrettably this last example of the primacy of religion is somewhat marred by Newman's example; "thus in the science of history the preservation of our race in Noah's Ark is a historical fact, which history would never arrive at without Revelation" (ibid, p.105).

In the early twentieth century Freud considered the psychological relations between religion and education, his attitude being that education and religion are complementary alternatives. In Civilisation and its Discontents (1930) he quotes Goethe's aphorism:

> "He who possesses science and art also has religion;
> but he who possesses neither of these two,
>   let him have religion."

Thus religion, "the universal obsessional neurosis of humanity", is a relatively primitive state whose "doctrines bear the imprint of the times in which they arose, the ignorant times of the childhood of humanity" (New Introductory Lectures, p.204); it had served useful purposes in the evolutionary past, but with the advent of science and the arts had been rendered obsolete. "The more the fruits of knowledge become accessible to men, the more widespread is the decline of religious belief ..." (The Future of an Illusion, 1928). The implication is that the scientific training of the medical student will produce a concomitant decline in his religious beliefs.

The question of the inter-relation between science and religion has continued to be of interest until the present day (see e.g. Eister, 1978), with clear empirical evidence being presented that science graduates are less likely to be religious than are either Arts graduates or the general population (Stark, 1963; Argyle and Beit-Hallahmi, 1975).

A number of empirical studies have found evidence that as students pass through university they become less religious, both in transverse studies (Poppleton and Pilkington, 1963; Rites, 1965; Feldman, 1969; Pilkington et al, 1976; Humsberger, 1978;) and in longitudinal studies (Ferman, 1960; Pilkington et al, 1965), although as Argyle (1958; p.44) and Scobie (1975; p.142) have pointed out, it is difficult in such studies to separate direct effects of education from effects of age or maturation, and Argyle and Beit-Hallahmi (175; p.66) have argued that historical (i.e cohort) effects may be of the most importance.

Some studies have examined differences in religiosity between different university faculties (see e.g. Argyle, 1958, p.46). Poppleton and Pilkington (1963) and Pilkington et al (1976) have specifically examined medical students, and in both studies found them to be somewhat more religious than other science students. Furlong (1961) has suggested that medical students in particular tend to swing back towards religion in their clinical years.

The present chapter attempts to answer several separate but related questions about the religious behaviour of medical students:-

1. Is there an an increased prevalence of agnosticism and atheism as medical students progress through their medical training?

2. If there is, is this a consequence of medical training <u>per se</u>, or it is perhaps better explained in terms of the concomitant maturation of students as they pass through medical school?

3. Amongst those who consider themselves to be Christians, what are the effects of medical study and of maturation upon their church attendance?

4. Is there any evidence of cohort changes, entrants in recent year being more or less sympathetic to religion?

5. What background factors predict high or low religion in medical school applicants and is there any evidence that those accepted are less religious than those who are accepted? Scobie (1975; p.119-122) has suggested that the religious are more neurotic and less extraverted than non-religious individuals. Argyle (1959) and Scobie (1975) have both described how females are generally more religious than males.

<u>Method.</u>

Data from the St. Mary's and the Birmingham studies have been used:-Statistical analysis was by means of the Statistical Package for the Social Sciences (SPSS) (Nie <u>et al</u>, 1975; Hull and Nie, 1981).

The questionnaire contained two questions to assess religious activity. The first assessed religious self-typing, and asked:

"How would you describe your religious beliefs? Christian/ Jewish/ Agnostic/ Atheist/ Other (please specify)"

The second question assessed church attendance and was only analysed for those who described themselves as Christians, Agnostics or Atheists:

"How often do you attend church: Never/ On festive occasions only/ Between three and ten times per year/ About once a month/ Every week"

Results.

Table 12-1 shows the response to question 1 in the Birmingham and St. Mary's surveys. The proportion of those responding Jewish or Other was sufficiently low to mean that they were omitted from further analysis. Table 12-2 shows for the combined St. Mary's and Birmingham samples the relation between religious self-typing and church attendance. It can be seen that the majority of church attenders are Christians, although the correlation is far from perfect. Subjects in the study were classified into seven religious groups according to their response to questions 1 and 2, the Christians (but not the Atheists or Agnostics) being sub-divided into five groups on the basis of their church attendance, the result being a seven-point scale from Atheist (scale value = 1) through to Christians attending church every week (scale value = 7). Two reduced forms of this scale, Christians versus non-Christians and Church attendance in just those who replied ˈChristian' were used to distinguish effects of Christian belief from   effects   of   church attendance.

Table 12-3 shows the correlations of the scales of the EPQ and STAI with religous grouping, Christian vs non-Christian and Church attendance. Higher scores on religious grouping correlate significantly with lower scores on the neuroticism scale of the EPQ and the State anxiety score of the STAI, both results being in the opposite direction to that reported by Scobie (1975). The more religious applicants also reported higher scores on the EPQ Lie scale. A broadly similar pattern of correlations

was found for Christian vs. non-Christian, but not for Church attendance, suggesting that belief rather than church attendance was the primary cause of these correlations.

Applicants in the St. Mary's study had information scored on nineteen variables of general interest and of interest to the selection process; sex; social class; the presence of a medical parent; living in the North of England, or Scotland or Northern Ireland; evidence of a private sector education; the overall size of the school; the size of the sixth form, and the number and proportion of the sixth form going to university; maths or biology taken at A-level; application post-A-level; previous university application; the number of university choices on the application form; the number of medical schools and the number of London medical schools on the application form; whether the applicant was aged over 21; the use of bracketing on the application form; and whether or not Oxbridge was included on the application form. The three separate measures of religion were used as dependent variables in a hierarchical multiple regression on all of the nineteen independent variables. For religious grouping the only significant effect was that post A-level applicants were less religious ($F(1,276)=6.21$, $p<0.05$), a result that is probably a type I error given that the effect of adding in all 19 variables was not significant ($F(19,258)= 0.82$, NS). The variable Christians vs non-Christians showed an identical pattern of results as that of religious grouping. Church attendance in Christians showed only one significant relationship, those from smaller schools tending to attend church more often ($F(1,198)=3.98$, $p<.05$), and once more this is probably a type I error, given that the joint effect of the the independent variables was not significant ($F(19,180)=0.66$, NS).

Figure 12-1 shows the proportion of individuals in each religious group as a function of year in medical school (the St. Mary's study of applicants being regarded as in year zero for present purposes). It can be seen that there is a highly significant systematic shift as students pass through medical school from the more religious to the less religious groups (Kendall's tau-c = .085, p<.001). The trend involves a shift from Christian to non-Christian groups (Kendall's tau-c = .135, p<.001), and a decrease in church attendance amongst those describing themselves as Christians (Kendall's tau-c = -.058, p<.05). That the transverse results of figure 12-1 are not an artefact of cohort or other effects is shown by analysing the results of the longitudinal part of the study. Table 12-4 shows the data for 153 students who were assessed on two separate occasions, from one to four years apart. 81 individuals (52.9%) showed identical religious groups on the two occasions. 51 individuals (35.3%) had become less religious by the second assessment, and 18 (11.8%) had become more religious, indicating a highly significant diminuition in religiosity (Chi-squared = 17.01, 1df, p<0.001). Amongst those who called themselves Christians on both occasions, 25 attended church less on the second occasions and 8 attended it more often (Chi-squared = 7.76, 1 df, p<.01). Restricting the analysis to just Christians and non-Christians (Atheists and Agnostics combined), 131 had not changed their status, 18 had moved from the Christian to the non-Christian group, and 4 had made the reverse passage (Chi-squared = 7.68, 1 df, p<.01).

It is thus clear, both on the basis of transverse and longitudinal data, that medical students become less religious as they pass through medical school. The important question concerns whether this change is direct   consequence of medical schooling per se, or is rather consequence of the concomitant ageing or maturation of the student Since not all students entering medical school are of identical age it

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possible to partition effects into those due to age and those due to medical schooling. In addition the year of entry into the medical school (the cohort) may be examined, in case apparent longitudinal effects in the transverse study are actually cohort effects.

A hierarchical multiple regression of the data from the Birmingham study was used to assess the effects of years in medical school (1 to 5), age in years, and year of entry (1973 to 1981), the significance of each term being assessed after each of the other two had been entered into the regression equation. The dependent variable in the first analysis was the seven-point religious grouping.

Age had a highly significant effect $(F(1,864) = 1.79, p<.001$; beta = -.095), whereas neither years in medical school $(F(1,864)=0.319$, NS; beta= -.031) nor cohort of entry $(F(1,864) = 2.539$, NS; beta = -.069) had significant effects. A similar result was obtained when Christian vs non-Christian was the dependent variable. Considering just those groups who described themselves as Christians, and with church attendance as the dependent variable, there was a highly significant effect of age $(F(1,524) = 31.58, p<.001$; beta = -.272), the effect of years in medical school also being significant $(F(1,524)=8.62, p<.05$; beta = .164), the positive beta coefficient indicating that in this group church attendance increases with years in medical school, after account has been taken of decrease in attendance as a result of increasing age. There was no effect of cohort $(F(1,524)=0.394$, NS; beta = -.035).

Female students were significantly more religious than male students in the Birmingham study, after account had been taken of year of study, cohort and age $(F(1,862) = 20.25, p<.001)$. There was however no evidence for interactions between sex and year of study, cohort or age $(F(3,859).216$, NS). Similar results were found for Christians vs. non-Christians

and for church attendance amongst the Christians (effect of sex, p<.0001 and p<.05 respectively). The St. Mary's study of applicants showed no significant differences in religious grouping, or in any of the other scores, between the sexes (F(1,307)=1.54, p=.215 for sex), although the trend was in the predicted direction, females being more religious than males.

Discussion.

The results of this study have confirmed the result of many other studies (Argyle and Beit-Hallahmi, 1975; pp.71-79) that women are more religious than men, both in their self-description and in church attendance. The study fails however to replicate previous suggestions that the religious are more neurotic and introverted than the

non-religious; indeed the religious appeared to be more stable than the non-religious. The religious also had significantly higher Lie scores, a result which is perhaps best interpreted in terms of the suggestions of Crookes and Buckley (1976), Kirton (1977), Massey (1980) and Eysenck and Eysenck (1976: pp 160 - 170) that the Lie scale is more interesting than being simply a measure of intention to deceive, and rather individuals with high L scores are "lacking insight or self-awareness", "inaccurate, uninsightful but honest self-assessers", or "conformists". Certainly any of these views would be compatible with the positive correlations with religious beliefs.

The present study shows clearly, both on a transverse and a longitudinal basis, that medical students decrease in their religious views as they pass through medical school, both in terms of whether they describe themselves as Christians, and if so, whether they attend church regularly. Multiple regression analyses suggest that the overall decline

in religious views is not a direct consequence of medical schooling <u>per</u> se but is rather a consequence of the concomitant ageing or maturation of the students. Indeed while there is a decline in church attendance among Christians with increasing age, there is also an increase associated specifically with years in medical school.

It therefore seems, despite conventional suppositions, that religious views of medical students do not change as a consequence of the necessarily materialistic nature of their studies. Neither incidentally is there any suggestion that medical schools tend to select those who are least religious from amongst those who apply to then (although it is conceivable that applicants as a group may be more religious than non-applicants).

What factors in the maturation of these students might be leading to decreased religiosity? Argyle (1958) has summarised a number of theories of religious involvement.

Social learning theory suggests that parental attitudes and modelling of social leaders are important determinants of religious attitudes. Carrier (1965; p.253) has argued that the loss of religion in young adults is mainly a result of a loss of reference groups, in particular parents and church. Brown (1962; p.259) has "concluded that religious belief is a relatively isolated cognitive system requiring strong social support for its maintenance". Clearly such explanations have great potential for explaining change in student attitudes; students have left the parental home and are exposed to an environment which on aggregate is less religious than are the new entrants. In addition actual opportunities for worship may be disrupted or diminished as a result of migration to a different geographical area; Wuthnow and Christiano (1979) have shown how regional mobility decreases church

attendance in America. **That** church attendance among Christians increases as students pass through medical school, as a direct result of years of medical schooling, might be interpreted as an increasing social cohesion among students, facilitating church-going amongst those who are Christians.

A second group of theories emphasises religious behaviour as a response to frustration or deprivation, either instinctual (and particularly sexual, as in Freudian theory) or social (as in Marxist theory). Although medical students might well show less deprivation in economic, status, social need or sexual terms than they did prior to having entered medical school, such an effect would be non-specific and primarily related to age or maturation. However as a specific result of their medical training, medical students are more exposed to illness and death, which might increase their fear of these events (and medical student hypochondriasis is a well-recognised phenomenon (Woods et al, 1966), and hence should increase their religiosity. From the results of Figure 12-1 however it is clear that there is no evidence for any particular change associated with the transition from pre-clinical to clinical studies (i.e. between those tested at the beginnings of years 3 and 4), suggesting that this factor is of little importance, particularly given that Howells and Field (1982) found that medical students did not have a particularly increased fear of death and dying, as compared with a control group of social science students.

A third theory suggests that religion arises because of conflict between the super-ego of the individual and his instincts, the conflict being reduced by projection of the super-ego as God. Religion therefore assuages guilt. It is thus possible that medical students might feel less conflict as a result of understanding the origin of instinctual

needs.

Freud (1907) , in his paper on 'Obsessive act s and religious practices', noted the similarity between the ritualistic acts of religion and the rituals of the obsessive-compulsive. In so far as medicine involves many quasi-rituals (the learning of anatomy; the 'catechism' of clinical examination; the 'grand round'), coupled with the inevitable discipline of professional life, it may be felt that the medical rituals could replace those of the church.

Cognitive need theories speculate that the major mechanism of religious belief is a cognitive striving to understand. In so far as medicine provides answers to many questions concerning the nature of existence (and in particular Darwinian biology can be regarded as providing a potentially complete explanation, at least of biological existence) it might be felt that medical students would have less 'need to understand'.

The previous four theories (fear or illness or death; conflict reduction; obsessive rituals; and cognitive need) could all provide explanations of specific effects of medical education upon religious behaviour. However medical education per se has no specific effects upon religion and thus these explanations are unacceptable. Any explanation of the loss of religion in medical students must be a general one related to effects of age or maturation.

In summary it would seen that whilst medical students do become less religious as they pass though medical school, this is not a consequence of medical schooling. That individuals become less religious as they mature is a frequent survey finding, for instance when adult religion is compared with family religious background (e.g. Roof and Hadaway, 1979);

similarly Vetter and Green (1932) found that the majority of atheists became 'converted' during the ages of 15 - 24. The age of 30 would seem to be the nadir of religious activity (Argyle, 1958; p.67), although this result is generally based on potentially deceptive transverse studies, and Nelson's (1956) longitudinal study found opposite trends. In conclusion there is no specific effect of medical school to be explained, only the more general problem of what Argyle (1958) has called "the important and little-known phenomenon ... [of] the decline in religious activity between 18 and 30".

Figure 12-1. Shows the proportion of individuals in each of the seven religious groupings. Years 1 to 5 represent individuals at the beginnings of the first pre-clinical through to the third clinical year in the Birmingham sample. Year zero presents applicants to medical school in the St. Mary's survey (approximately one year before medical school entry).
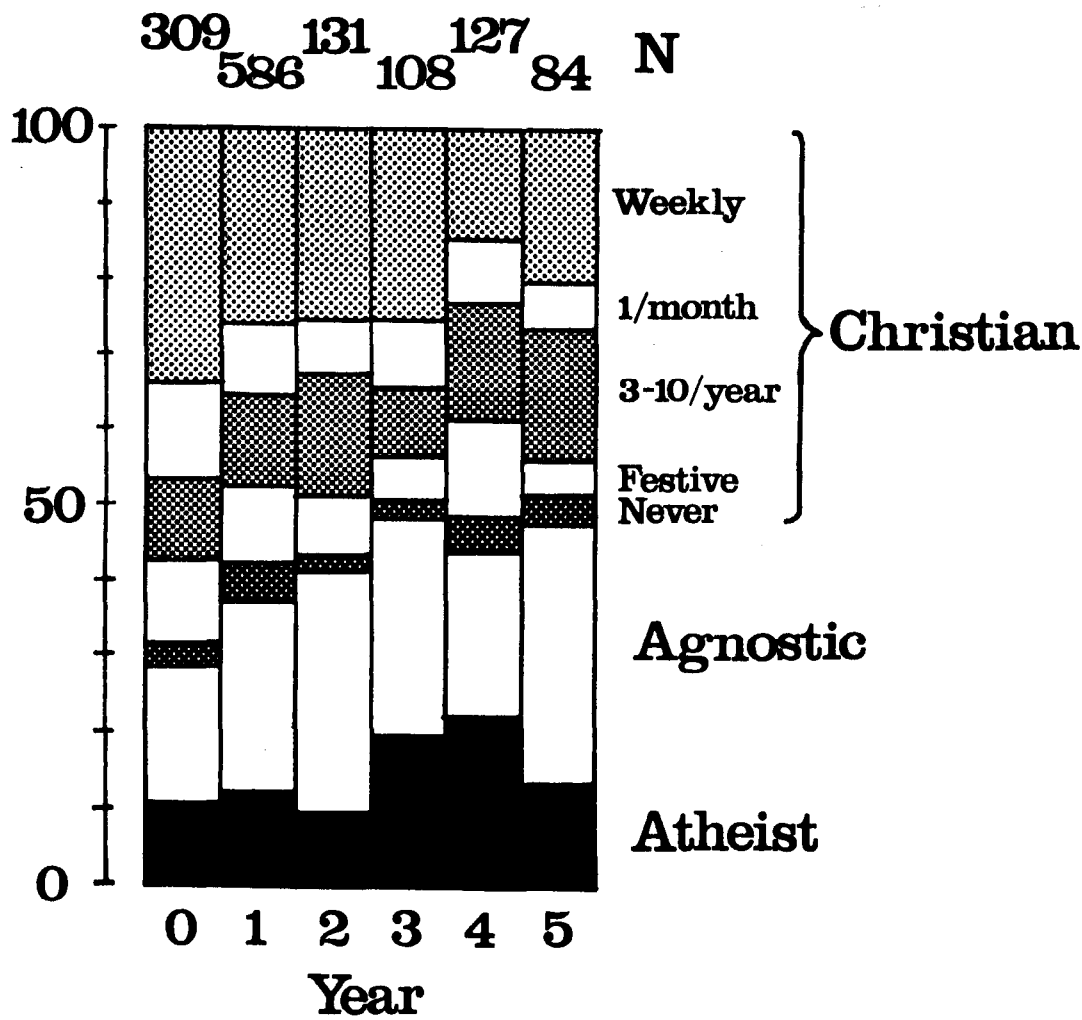
Table 12-1: Responses to question 1 concerning religious beliefs. Figures in brackets are percentages of column totals, excluding those who did not give an answer at all.

	St. Mary's Study	Birmingham study
Christian	220 (65.9)	553 (57.0)
Agnostic	56 (16.8)	234 (24.1)
Atheist	34 (10.2)	126 (13.0)
Jewish	7 (2.1)	14 (1.4)
Other	17 (5.1)	37 (4.5)
Not answered	10 -	37 -
Total (excluding Not answered)	334 (100.0)	964 (100.0)

Table 12-2: Shows church attendance as a function of religious self-typing for the combined Birmingham and St. Mary's data sets. Figures in brackets are percentages of column totals.
Kendall's tau-c = -.458, p<0.001.

| | | Religious self-typing | | |
		Atheist	Agnostic	Christian
	Never	118 (75.2)	135 (47.9)	49 (6.4)
	Festive occasions only	30 (19.1)	97 (34.4)	120 (15.7)
Church attendance	3 - 10x per year	6 (3.8)	38 (13.5)	157 (20.5)
	Once per month	0 (0.0)	6 (2.1)	122 (16.0)
	Every week	3 (1.9)	6 (2.1)	316 (41.4)

Table 12-3: Shows the correlations between the three measures of Religion and the four dimensions of the Eysenck Personality Questionnaire and the Two measures of the State-Trait Anxiety Inventory. (NS: Not significant; + p<.10; * p<.05; ** p<.01; *** p<.001)

	Religious grouping	Christian vs Non-Christian	Church attendance
EPQ-E	-0.0296 NS	0.0484 NS	-0.0064 NS
EPQ-N	-0.1141 +	0.0948 NS	-0.0724 NS
EPQ-P	-0.0851 NS	0.0831 NS	-0.0052 NS
EPQ-L	0.1961 ***	-0.1917 ***	0.0515 NS
STAI State	-0.1090 +	0.1056 +	0.0090 NS
STAI Trait	-0.0831 NS	0.1188 +	0.0472 NS

Table 12-4: Shows the religious group of 153 Birmingham students who were assessed on two separate occasions between one and four years apart, the group on the first assessment being shown on the top of the matrix, and on the second assessment on the side of of the matrix. Underlined values indicate identical responses on the two occasions.

	First assessment						
	Atheist	Agnostic	----- Christian ----------				
			Never	Festive	3-10/year	Monthly	Weekly
Atheist	.12	11	1	0	4	2	0
Agnostic	6	25	1	4	2	2	2
Christian: Never	0	0	2	1	0	0	0
Christian: Festive	0	0	0	3	5	2	1
Christian: 3-10/year	0	2	0	2	8	8	3
Christian: Monthly	0	1	0	1	2	3	5
Christian: Weekly	0	1	0	1	0	2	28

13: Religion. culture and attitudes: correlations and causation.

"general culture of mind is the best aid to professional and scientific study"

J.H.Newman, <u>The Idea of a University.</u>

"The spectator of <u>Anna Karenina,</u> who has sympathised with Anna, pitied her, foreseen the coming tragedy and watched helplessly as her body was crushed beneath the train, the spectator who has <u>by that fact</u> gained greater insight into himself and other people, has increased his fitness both as an individual and as a member of society. Likewise with ... other cultural mechanisms..."

Nick Humphrey, <u>Consciousness Regained.</u>

"The liberal arts have a legitimate place in medicine, not as gentle accoutrements and genteel embellishments of the medical 'art', or even to make the physician an educated man. Rather they are as essential to fulfilling the clinician's responsibility for prudent and right decisions as [are] the skills and knowledge of the sciences basic to medicine."

Pellegrino (1979b; p.192)

Summary.

The attitudes of medical students in the Birmingham study are analysed to find the correlations of those attitudes with measures of culture and of religion, and a cross-lagged panel correlation is then used to assess the causal relations implicit in such correlations. It is concluded that changes in religion cause changes in libertarianism, whereas changes in tough-mindedness cause changes in cultural activity.

To understand the 'art' of medicine we must look at the attitudes of doctors and the factors which determine them. Medical training p<u>er se</u> has little effect upon changes in attitudes, the exceptions being attitudes to '6:Medical Control', '8:General Practice', '3:Liberalism', and 'II:Tough-mindedness *(see* chapter 9). Two major candidates arise for non-medical causal determinants - religion and culture. The relations between religion, culture and attitudes (perhaps in some ways better considered as politics or ethics) are complex, with almost all possible causal relations between them having been proposed.

Eysenck (1954) has suggested that social attitudes may be described in terms of two orthogonal dimensions; liberal ism-conservatism (describing the traditional left-right dimension of politics) and tough-mindedness - tender-mindedness (a dimension which differentiates extremist political views from more central positions). In considering religion, attitudes and culture it is necessary to think clearly in terms of both of these two dimensions; most theorists do not explicitly differentiate them, but most are probably concerned with an integral of the two components, although there are exceptions.

<u>An overview.</u>

<u>Conventional theology </u>suggests that religion is the prime mover, and it therefore determines both acceptable attitudes and the nature of cultural behaviour (although see Niebuhr (1952) for an account of the complexities and subtleties of modern theological thought). In so far as religion is time-less, the attitudes are conservative and unchanging (see Woolf, 1937, pp175-195; Tawney, 1938, p.87; and Trilling (1982; p.48) "Almost to a man the Oxford [movement of the 1830s] condemned political, economic and social change"). In that culture in a broad sense can

modify attitudes by encouraging independent thought, culture is not encouraged. As a specific example see item 18 in Newman (1902; p.296)'s list of items of liberal theory with which he explicitly disagrees. As a general example consider mediaeval European culture, which was essentially a theocracy, the arts were subservient to the church, independent thought was strongly discouraged, and attitudes were essentially conservative, in the sense that they were both illiberal and tough-minded. The model of the relationships may be represented:-

```
                    -ve    \
        Increased .........\ Increased
        religion          /   culture
            .            /        .
            .           /         .
             .                   . +ve
        -ve    .                 .
               .             \  . /
            .  |              \ ./
              .|               \/
         _____ |
                        Liberal
                        attitudes
```
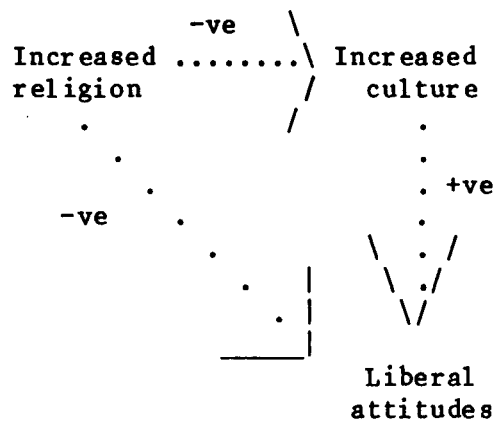
Traditional liberal theories (for philosophical introductions to which see Russell, 1946, and Brubacher, 1982, pp74-93; for historical accounts see Chadwick, 1975, chapter 2, and Arblaster, 1984; and for a more informal view see Bell, 1938, p.149 et seq) take the view that culture, in the form of a broad education, produces a direct liberalising effect on attitudes, and also acts to decrease the influence of religion.

Sidgwick (1867) in his contribution to Farrar's Essays on a Liberal Education stated that:

> "... a liberal education has for its object to impart the highest culture, to lead youths to the most full, vigorous and harmonious exercise, according to the best ideal attainable, of the active, cognitive and aesthetic faculties" (p.87).
> "... if so many professional persons confine their extra-professional reading to the newspapers and novels; if the middle-class Englishman... is narrow, unrefined, conventional, ignorant of what is really good and really evil in human life; if 'he is the tool of bigotry, the echo of stereotyped opinions, the victim of class prejudices, the great

> stumbling block in the way of a general diffusion of higher cultivation in the this country', ... it is because the education has not been ... literary" (p.129).

According to Matthew Arnold, "culture, which is the study of perfection, leads us ... to conceive of true human perfection as a harmonious perfection, developing all sides of our humanity; and as a general perfection, developing all parts of our society" (Arnold, 1868; see also Trilling, 1982, pp.252-291 and 371; Connell, 1950, pp.157-169). As Williams (1963, p.124) puts it, after citing the above passage, culture "is not merely the development of 'literary culture', but of 'all sides of our humanity". Of course the influence of education on attitudes had been recognised long before the age of Mill, Arnold and Sidgwick. Thus in 1807 the President of the Royal Society spoke in the House of Commons, opposing the introduction of elementary schools, since, "giving education to the labouring classes of the poor ... would render them factious and refractory ... it would enable them to read seditious pamphlets, vicious books, and publications against Christianity; it would render them insolent to their superiors..." (cited in Woolf, 1937, p.93). Culture in liberal theory is represented through the all-pervasive influence of education, acting on the tabula rasa of the human psyche, and the causal model may therefore be represented:

```
                    /  -ve
        Increased /........ Increased
        religion  \           culture
          ____    \              .
         | .       \             .
         |  .               . +ve
             .              .
      -ve      .        \  . /
               .         \ ./
                 .        \/
                   .
                 Liberal
                 attitudes
```
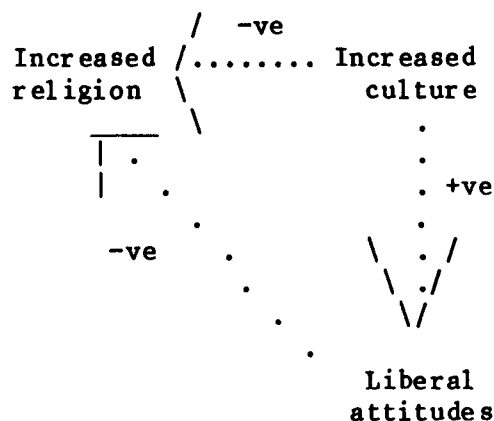
Some theorists, for instance Jaspars (1960) and Durkheim (1925), argue that culture and aesthetics are important in developing the mind, but do

not specify any specific direction of influence; rather the suggestion
is that culture perhaps makes people less extreme in their views e.g.
"Art is a noble form of play; it is <u>morality </u>extending its action into
our hours of leisure and marking it with its own character" (Durkheim,
p.273; my emphases).

    <u>Psycho-analytic theories </u>stress the primacy of attitudes, which
arise from fundamental conflicts within the psyche ("I want to state the
conclusion that the beginnings of religion, ethics, society and art meet
in the Oedipal complex"; Freud, <u>An Autobiographical Study, p</u>.207). A
particular attitude is a neurotic response to parental rejection, and the
consequence is an increase in religious behaviour. If on the contrary
the person adjusts to the universal neurosis then he develops an interest
in culture in compensation for the earlier 'cultural rejection' which he
had suffered. In addition cultural knowledge can decrease religious
involvement. The model is therefore best stated as follows, although
Philp (1956) has suggested how difficult it is to be entirely sure of
Freud's position on these topics:-

```
                         /  -ve
            Increased /.........  Increased
            religion  \            culture
              ____     \              /\
             |   .       \           /  .\
             |    .       \         /   . \  +ve
                   .                /   .  .
              -ve   .              /    .
                     .                  .
                      .                 .
                       .                .
                        .               .
                          Liberal
                          attitudes
```
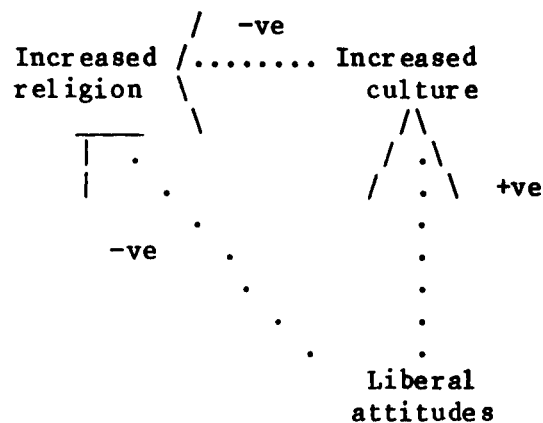
Fromm (1950) changes this model slightly and suggests that psychoanalysis
is only a threat to what he calls 'authoritarian religion'. Later
workers have suggested that the relationship between attitudes and
culture in the psychoanalytic system may be more interactional, Culler

(1976; p.72) describing how "Freud made it apparent ... how the culture suffices the remotest parts of the individual mind" (see also the quotation by Winnicott on the title page of chapter 10).

A fourth position which must be mentioned is that of <u>Marxist theory.</u> Marx and his followers have attempted to create a comprehensive theory of man and his societies, and as such the theories might be expected to make statements about the relations of religion, culture and attitudes. However in practice Marx makes no specific analysis of these problems, and his followers have been obscure to the point of near incomprehensibility (the essays of Althusaer (1967) being a case in point). More difficult is that many of the causal inter-relations appear to be dialectical rather than directional, with each component influencing the other in an interactionist spiral. A crude interpretation of Marx is that the economic infra-structure of a society is the root cause of all facets of the supra-structure, which must include the attitudes, religion and culture of that society.However that is a sociological rather than a psychological analysis (and may itself be wrong, since, as Dupre (1983) has pointed out, Marx himself treated culture and aesthetics as being of greater importance than his followers have realised). At the individual, psychological level, and ignoring the mass consequences of individual actions feeding back upon the collective consciousness of society, Marx probably felt that economics determined fundamental attitudes, and that it was those attitudes which subsequently created interests in religion or culture (although culture itself could feed back directly upon attitudes - see Dupre (1983; p.274)); "The foundation of irreligious criticism is this: man makes religion, religion does not make man" (Marx, 1844). The relation betwen culture and religion is probably that the increased social awareness induced by culture will indirectly cause a decrease in

unsophisticated religious indulgences (Marx's "opium of the people"). Marx's theory is in some ways similar to Freud's, the major difference being in the origin of attitudes, be it in the conflicts of the psyche or the economics of class conflict, although Marx's theory potentially encapsulates aspects of liberal theory with his emphasis upon the primacy of culture as a source of insight and hence change. Because of this lack of clarity in the theory it will not be considered further.

The three theories, theological, liberal and psycho-analytic, between them contain all three factors as the primary motivator. All contain the assumptions that individuals with strong religious beliefs should be less liberal and less cultured, and that individuals with liberal attitudes should be more cultured. Where they differ is in their attribution of causality between the variables.

Two separate types of empirical question must therefore be asked:-

1. Are there <u>correlations</u> between attitudes, religion and culture, and are these correlations in the predicted direction?

2. Is there evidence for <u>causal</u> relations between attitudes, religion and culture, which are compatible with any of the theories?

Before considering the empirical questions by reference to data it is necessary to consider the various correlations and causations in turn, illustrating in turn what has been proposed about each. Most of the illustrations will come not from psychological studies <u>per</u> se but from 'critical studies' (in their widest sense), from education, from philosophy, from political theories, and from sociology. No apology is made for this emphasis; it simply reflects the relative lack of interest of the behavioural sciences in these broad questions. An inevitable interpretative problem however is that sometimes it is not clear whether

theorists are speaking at the individual, attitudinal level, or at a broader more social, or even anthropological, level. There is no sense in which these descriptions will be complete: a history of western intellectual thought could be compiled around the response of thinkers to these profound problems.

1. <u>Culture and Religion.</u> Pascal restated the classic view of the relation of culture and religion, when he suggested that man has "a secret instinct which impels (him] to seek amusement", but that such escape from the "constant unhappiness" which besets him is dangerous since "All great diversions are a threat to the Christian life", tending to destroy the heightened consciousness of our inner selves produced by solitude and contemplation (see Lowenthal, 1961; p.17).

T.S. Eliot considered the relationship of culture and religion most carefully, although not in the clearest way; indeed he says that, "the way of looking at culture and religion which I have been trying to adumbrate is so difficult that I am not sure I grasp it myself except in flashes ..." (p.30). Eliot starts by criticising Matthew Arnold who, in his <u>Culture and Anarchy</u> (1868) "gives the impression that Culture (as he uses the term) is something more comprehensive than religion" (i.e. that religion is a sub-set of culture). In Arnold's sense culture must determine religion. Eliot substituted the view that culture and religion are "different aspects of the same thing" (p.29), that neither can survive without the other. This theory therefore predicts a positive correlation between religion and cultural involvement. The situation however becomes more complicated, for later Eliot tells us that, "the identity of religion and culture remains on the unconscious level, upon which we have super-imposed a conscious structure wherein religion and culture

are contrasted and can be opposed" (p.68). In this latter position, which implies a negative correlation between culture and religion, Eliot explicitly states that he is talking, "from the point of view of the sociologist, and not from that of the Christian apologist" (p.68). Eliot's second theory is far closer to psycho-analytic theory, where Freud argues that religion and culture are alternatives, there being a negative correlation between the two (e.g. The Future of an Illusion, p.68; Civilisation and its Discontents, p.74).

Bertrand Russell clearly saw culture and religion as being alternatives, in opposition to one another: "For those to whom dogmatic religion can no longer bring comfort, there is need of some substitute ...what is needed is not this or that specific piece of information, but such knowledge as inspires a conception of the ends of human life as a whole; art and history, acquaintance with the lives of heroic individuals, and some understanding of the strangely accidental and ephemeral position of man in the cosmos — all this touched with an emotion of pride in what is distinctively human, that power to see and to know, to feel magnanimously, and to think with understanding" (Let the People Think, pp 90-91). In short, culture is a necessary substitute for religion and should be negatively correlated with it.

2. Culture and attitudes. One of the clearest statements of the liberal-idealist relation of culture is that of Schiller; "art has for its object not merely to afford a transient please ...; its aim is to make us absolutely free" (Lowenthal, 1961; p.26).

Russell was clearly considering tough-mindedness, when he said in his essay on "Useless" knowledge' that "some of the worst features of the modern world could be improved by a greater encouragement of [culture] and a less ruthless pursuit of mere professional competence" (p.85); "there is in untrained human nature a very considerable element of cruelty ... Now while it must be admitted that highly educated people are sometimes cruel, I think there can be no doubt that they are less often so than people whose minds have lain fallow" (p.87). Russell suggested not only a correlation but also a causal relation: "Culture gives a man less harmful forms of power and more deserving ways of making himself admired" (p.87).

George Steiner is not convinced about "the axiom which correlates humanism - as an educational programme, as an ideal referent - to humane social conduct" (In Bluebeard's Castle, p.60). He argues that the lesson of two World Wars must be of the fragility of culture as "a barrier against political bestiality" (p.31). "Nothing in the next-door world of Dachau impinged on the great winter cycle of Beethoven chamber music played in Munich. No canvases came off the museum walls as the butchers strolled reverently past, guide-book in hand" (p.54); "Men such as Hans Frank who administered the 'final solution' in eastern Europe were avid connoisseurs and, in some instances, performers of Bach and Mozart. We know of personnel in the bureaucracy of the torturers and of the ovens who cultivated a knowledge of Goethe, a love of Rilke" (p.63). One is reminded of Adorno's remark that "to write poetry after Auschwitz is barbaric" (Jay, 1984, p.19). Steiner hints that we should perhaps reject "the boisterous confidence in the immediate correlation of better schooling with an improved society -

particularly in American progressive doctrines and Victorian socialism" (p.61) and ask instead whether "it is more realistic to perceive in humanistic culture express solicitations of authoritarian rule and cruelty?" (p.31), pointing out that "Great art, music and poetry, the science of Bacon and Laplace, flourish under more or less totalitarian modes of social governance ... Is not the very notion of culture tautological with elitism?" (p.69). A different viewpoint which also suggests that the humanities might render individuals more conservative and less liberal is that of Thorstein Veblen (1899; p.377), who argues from an economic analysis of leisure.

Within medicine there is a recurrent belief that its practitioners should be 'cultured', and the implication is that ethical practice is not possible without it. Flexner (1925) in his Medical Education comments on Bilroth's Lehren und Lernen der medicinischen Wissenschaften of 1876; "Very significantly, Bilroth called his book a study in the history of culture" (p.18). The Royal College of Surgeons in its evidence to the Pilkington Commission (Royal Commission, 1960) felt that it was necessary to have at least a nucleus of "students from cultured homes" (Ferris, 1967, p.13). Sinclair (1972) argues that culture is important in some sense ("too many people qualify in medicine in ignorance of most of the glorious span of English literature" (p.118)), although he is also quite clear that culture cannot be made a part of the curriculum; "the fact is that culture cannot be enforced" (p.96) - culture being seen to have its effects precisely because it is a voluntary exploration of the world of ideas, rather than a compulsory part of a course. A rejoinder to that argument must of course be that all other subjects in the pre-clinical and clinical course are probably in a similar position. Constable (1975), writing about the MRCP exam, suggested

that "the examination remains partly a test of culture although knowledge of Latin, Greek, French and German is no longer required ...". Several recent workers (Clouser, 1971; Pellegrino, 1974; Moore, 1976, 1977, 1978; Reynolds and Carson, 1976) have argued for medical humanities' in the curriculum; "to perceive and understand health and disease in social and cultural context requires some knowledge of history, sociology, anthropology and religion ..." (Reynolds and Carson, 1976). Schwartz et al have however argued that the greatest disillusionment in American medical students can be in those who have contemplated careers in either medicine or the arts, "perhaps like Goethe's Faust they might complain 'two souls; alas, dwell within my breast'" (p.184).

Within the psychological literature the clearest statement on the relation between culture and attitudes is that of Murphy and Likert (1938; p.100 et seq) who, after finding a correlation between measures of radicalism and scholarship, argued that the intervening variable is probably 'bookishness'; "This consists in a love for and application to the printed page as a serious and vital factor in one's thinking and living". Bookish men, it is argued, are more radical since the world in general at that time was a radical world, and hence the majority of published books would have been radical in tone, and thus individuals would be more likely to be influenced in a radical direction; in 1760 it is suggested the world was conservative and hence the bookish would then be more conservative. Waples et al (1940) state the empirical problem most clearly. "Reading can supply information and can develop attitudes which make for social tolerance, co-operative enterprise, and good government. Whether reading does carry such values to any section of the

community at any given time would need to be determined" (p.25;

emphases in original).

3. <u>Attitudes and religion</u> The relationship between political and social attitudes and religious commitment has been well-studied by psychologists. There seems to be general agreement (e.g. Argyle, 1958; Eysenck, 1954; Bem, 1970; Scobie, 1975) that religious people are more conservative in their voting behaviour and their political attitudes, are more authoritarian, are more racially prejudiced, and less humanitarian (Kirkpatrick, 1949). In addition there is a strong suggestion that the relation between attitudes and religion may be curvilinear; "out-and-out atheists and agnostics are less [racially] prejudiced than church members who never go to church, while more frequent attenders are also less prejudiced. It is not the genuinely devout who are prejudiced but the conventionally religious" (Argyle, 1958; p.84). The curvilinearity may in part be explained by Fromm's (1950;p.42) description of the separate phenomena of "authoritarian and humanistic religion ... [which] can exist within the same religion", and by Jung's suggestion that "a creed coincides with the established church, or, at any rate, forms a public institution whose members include not only true believers but vast numbers of people who can only be described as ˈindifferentˈ in matters of religion and who belong to it simply by force of habit" (Jung, 1957).

<u>Correlation of attitudes, culture and religion.</u>

In this section each of the three inter-relationships will be examined in turn to consider whether the medical student data provides evidence for correlations.

4. Culture and religion. Figure 13-1 shows the mean score of each of the seven religious groups on the five orthogonal culture scales and on the general C:'Culture' factor. Significances of differences between groups, in terms of linear, quadratic and 'deviation' terms were assessed by a weighted one-way analysis of variance, using the SPSS program suite, and are shown in Table 13-2. Data from the Birmingham and St. Mary's studies are considered separately. Significant linear trends are shown in the Birmingham study (which was the the larger of the studies) for all six measures; significant trends are found for three of the six scores in the St. Mary's study, with almost significant trends (p<.1) for two of the remaining three variables. In general therefore the more religious students have lower scores on 1:Literary culture, 2:Low-Brow culture, 3:Travel, 4:Popular culture and C:'Culture", and higher scores on 5:Non-literary culture. With the exception of non-literary culture, there is therefore strong evidence for an antithesis between culture and religion.

Only two of the variables showed significant quadratic trends; 2:Low-brow culture, for which there is a suggestion that the atheists and the regular church-going Christians score more highly than predicted on a linear model; and 4:Popular culture for which regular church-goers have particularly low scores. 1:Literary culture shows a highly significant non-linear, non-quadratic trend, which seems to show that the highest scorers are agnostics and Christians in the middle-range of church-going. C:'Culture' also shows a non-linear, non-quadratic trend due to the relatively high scores of the same groups, reflecting the fact that 1:Literary Culture is partially contained within C:'Culture.

In summary these data provide support for the hypotheses of Eliot and Russell, that culture and religion are in opposition to one another, at least in what Eliot would call sociological terms.

2. <u>Culture and attitudes.</u> Table 13-1 shows, separately for Birmingham and St. Mary's samples, the correlations between the attitude scales and the culture scales. Considering the two super-ordinate attitude scales, and the general C:'Culture' factor it is clear that the more cultured individuals are more also libertarian and less tough-minded in their attitudes. The correlation of attitudes with C extends to all the first five attitudes which comprise attitudes I and II, the correlation being particularly strong on the 3:Liberalism dimension, although significant on all of the others. High culture scorers were also more sympathetic to 7:Sex education, but showed no correlation with attitudes 6 and 8. Examining the culture scales in more detail in relation to attitudes I and II, all show correlations in the direction expected given the correlation of I and II with C, with the important exception of 5:Non-literary culture, which shows correlations in the opposite direction to that predicted, high scorers being less liberal and more tough-minded.

Table 13-1 does not examine the possibility that culture and attitudes are related non-linearly, and in particular that there may be a quadratic relation, whereby cultured individuals are less extreme in their attitudes than non-cultured individuals. Before asking this question statistically we should examine the scattergrams of the two attitude scales against the culture scale. Figure 13-2 shows attitude I:Libertarianism as a function of C:'Culture', separately for the Birmingham and St. Mary's samples. Although curvilinearity is present this is almost entirely due to change in

variance of the attitude scale as one passes up the culture scale. Cultured individuals are mostly libertarian and show little variation, whilst individuals with low culture scales apparently have much greater variance, and take on a much wider range of libertarianism values. The significance of the heteroscedasticity is confirmed by Cochran's C test performed after grouping the culture scale into six portions (<-1; -1 to 0; 0 to 1; 1 to 2; 2 to 3; and >3); for the Birmingham sample C=.223, p=.005, and for the St. Mary's study, C=.468, p<.001. Figure 13-2 shows evidence of a significant quadratic term in both the Birmingham study (F(1,986)=17.94, p<.001) and the St. Mary's study (F(1,335)=10.68, p<.005). However these quadratic terms provide no no support for the hypothesis of a U-shaped relation between liberatarianism and culture, but rather it just demonstrates mild curvilinearity.

Figure 13-3 shows scattergrams of attitude II:Tough-mindedness in relation to C:'Culture'. In these plots there is once more evidence of heteroscedasticity (Birmignham study, Cochran's C=.257, p<.001; St. Mary's study, C=.314, p=0.002), and also of a significant quadratic trend in the Birmingham study (F(1,986)=30.76), p<.001), although not in the St. Mary's study (F(1,335)=2.64, p=0.10), although as with figure 13-2 the suggestion is of mild curvilinearity rather than a frank U-shaped distribution. In conclusion, there is no evidence that culture shows a U-shaped relation to attitudes, such that those with more extreme attitude scores differ in culture from those with more middling views; rather the more cultured are more libertarian and less tough-minded.

3. **Attitudes and Religion.** Figure 13-4a and b shows the mean score of each of the religious groupings on the eight orthogonal attitude scales, and the two super-ordinate attitude scales, significance levels being shown in table 13-2. Four of the attitude scales show a strong linear relation with religion, the most religious individuals having lower scores on 1:Vital libertarianism, 3:Liberalism, 4:Personal libertarianism, and I:Libertarianism. In the particular case of 1:Vital Libertarianism there is a strong non-linearity, the regular church-goers having particularly low scores. 8:General practice has a weak relation in both studies, which is only significant in the Birmingham study, Christians being more in favour of general practice. Three of the variables show a highly significant quadratic trend in the absence of a linear trend, 2:Social tough-mindedness, 5:Economic Conservatism, and II:Tough-mindedness having higher scores in Christians who attend church irregularly than in either Atheists or regular church-going Christians. Several variables show non-linear, non-quadratic trends, but none of these are in the absence of linear or quadratic trends, and are thus difficult to interpret.

In summary these data provide support for the suggestions of several writers that religious individuals are more conservative on the libertarianism scale (broadly equivalent to Eysenck's Liberalism-Conservatism dimension), and that tough-mindedness is particularly prevalent in those whom Argyle described as "not genuinely devout ... but ... conventionally religious" (see above).

Causal relations between attitudes. culture and religion.

Given that attitudes, culture and religion show clear inter-relations one with another, the question of greatest interest concerns the causal relations between them; do changes in attitude cause subsequent changes in religion, or do changes in religion subsequently cause changes in attitude? And similarly for relations with culture. These questions may, in principle, be answered by considering cross-lagged correlations between variables assessed at different times. Given two variables, A and B, measured at times 1 and 2, is the correlation higher between A1 and B2 than between A2 and B1? If so, then A is causing B rather than vice-versa (Kenny, 1979).

Questions of causation may be answered in the Birmingham study by considering those subjects who completed the questionnaires on two separate occasions, separated by an interval of from 1 to 4 years. These subjects were considered in four separate groups, according to the follow-up interval (the groups being considered separately since differences between groups in mean score by year would otherwise have masked more interesting differences). For each group the correlations between attitude, culture and religion on the two occasions were calculated, and the weighted mean of these correlations then found (the correlations being transformed to Fisher's Z-scores, weighted by the sample size, averaged, and then back-transformed to correlations). The ten attitude scores were considered separately in relation to the religious grouping, and the general C:'Culture' factor, and the correlations are shown in figures 13-5 to 13-14. Differences between synchronous correlations and between cross-lagged correlations were tested for significance using the Pearson-Filon test for correlated correlations (Peters and VanVoorhis, 1940).

1. **Culture and religion.** This relation is obviously identical in all of figures 13-5 to 13-14 and is included in each in order to facilitate inspection of relationships. In the restricted sample used for the longitudinal study there is only a small negative correlation between religion and culture, although it is in the predicted direction. Scrutiny of the cross-correlations reveals no significant differences, and we can conclude that neither culture causes religion nor vice-versa. Any correlational relationship must be determined by a third variable.

2. **Culture and attitudes.** Consider firstly the two super-ordinate attitudes, shown in figures 13-13 and 13-14. Attitude I:Libertarianism shows a positive correlation with culture, and this correlation is significantly higher on the second occasion than the first. However examination of the cross-correlations reveals no significant difference between them, suggesting the absence of a causal relation.

    Attitude II:Tough-mindedness shows a negative correlation between tough-mindedness and culture. The cross-lagged correlations are significantly different ($p<.05$) and the direction of the difference suggests that changes in attitude cause subsequent changes in culture, rather than vice-versa. If we consider attitudes 2, 3 and 5 (Figures 13-6, 13-7, and 13-8) in their relation to culture, then although none shows evidence of significant differences in cross-lagged correlations in its own right, attitude 2:Social toughmindedness is the only one of those three attitudes contributing to II which shows a trend towards significance ($z=1.416$), suggesting that this is the best candidate for theconstituent of II:Tough-mindedness which is modifying culture.

Attitudes 6,7 and 8 are independent of attitudes I and II and must be considered separately. Attitude 6:Medical control shows a difference in cross-correlations that although not quite significant (z=-1.57) is suggestive of changes in attitudes causing changes in culture. Attitudes 7 and 8 show little evidence of differences in cross-correlations.

3. <u>Attitudes and Religion.</u> Consider once more the two super-ordinate attitudes in figures 13-13 and 13-14. Attitude I:Libertarianism shows negative correlations with religious group. The cross-lagged correlation shows a significant difference (P<.05), the implication being that changes in religion cause subsequent changes in attitude, rather than vice-versa. In addition the synchronous correlation is also significantly higher on the second occasion, suggesting that the relationship is becoming of greater importance. Attitude I:Libertarianism is primarily composed of attitudes 1, 3 and 4. Examination of these components in relation to religion shows that attitude 1:Vital Libertarianism shows a highly significant difference in cross-lagged correlations (P<.001), in the same direction as that between I:Libertarianism and religion. Attitudes 3 and 4 show no trend towards different cross-correlations. The major component of change in I:Libertarianism is therefore 1:Vital Libertarianism.

Attitude II:Tough-mindedness shows no correlation with religion, and none of its components, attitudes 2, 3 and 5, shows evidence of differences in cross-lagged correlations with religion. We may conclude that there are no causal relations between religion and tough-mindedness.

Attitudes 6:Medical control, 7:Sex Education, and 8:General practice show no correlations with attitudes I and II, and must be considered separately in relation to religion. Figure 13-10 shows no evidence of an effect of religion upon 6:medical control. Figure 13-11 shows a difference between cross-lagged correlations which although not significant (Z=1.433) is suggestive that changes in attitude 7:Sex education are caused by changes in religion. With a larger sample the difference might attain significance. Attitude 8:General practice shows an interesting pattern in that the sign of the synchronous correlations changes, and this difference in synchronous correlations is significant (P<.01); the more religious are initially less sympathetic to general practice but subsequently become more sympathetic. Examination of the cross-correlations suggests that although none of the differences are significant that changes in religion might be causing changes in attitude, rather than vice-versa.

Discussion.

Analysis of the data from Birmingham and St. Mary's has confirmed most of the correlational predictions of previous theorists; the religious are generally less-cultured, and have less liberal attitudes (and show a curvilinear relation to tough-mindedness, as other workers have described); individuals with higher culture scores tend to be more liberal and lees tough-minded. However a causal analysis of change in these variables finds a pattern of effects which is different from any of those thus far described, the effects being different for the two major dimensions of attitude, liberalism and tough-mindedness. Decrease in religion causes an increase in liberal attitudes, as traditional

theological views would hold, and in opposition to Freudian or Liberal theories which propose the reverse direction of causation. However religion has no influence upon culture (in opposition to theological, Liberal and Freudian positions). Tough-minded attitudes are not influenced at all by religion, in opposition to all of the theories. Culture does not determine tough-minded attitudes (in opposition to theological and Liberal views) but rather it is determined by them, as Freudian theory would suggest to be the case.

We may summarise the causal relations in a design which is substantially different from the three presented earlier:-

```
                    -ve    \
     Increased .........\ Liberal attitude
     religion           /
                       /


                             -ve    \
            Tough-minded .........\ Culture
              attitude            /
                                 /
```
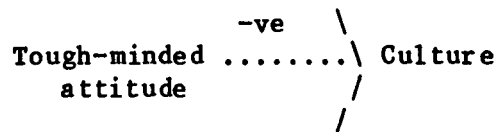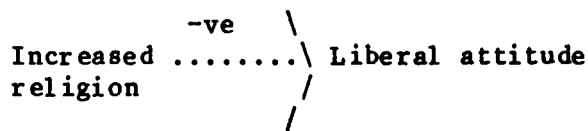
It should be noted that there is no evidence at all for liberal attitudes causing tough-minded attitudes, or vice-versa, the two dimensions being theoretically and empirically orthogonally.

There is little evidence for Steiner's suggestion that culture may precipitate more extreme political views, although an intriguing exception is the finding that high scorers on 5:Non-literary culture (which particularly includes musical activity) were less liberal and more tough-minded, a result in the opposite direction to that of culture in general, and which might be related to Steiner's amazement and despair that Nazi exterminators could also be proficient performers of Bach or Mozart.

Figure 13-1. Shows the mean score of individuals in each of the seven religious groups on the five orthogonal culture scales, and on the general 'Culture' factor. The Birmingham and St. Mary's samples are shown separately. Sample sizes for each group are shown at the top of the first column; it should be noted that the St. Mary's group of Christians who are non-church-attenders contains only eight individuals and should be interpreted with care. Significance levels for linear and quadratic trends are shown in table 13-2. Abbreviations: At: atheist; Ag: agnostic; Cl: Christian never attending church; C2: Christian, attending church on festive occasions only; C3: Christian, attending church 3-10x/year; C4: Christian, attending church about once a month; C5: Christian, attending church every week.
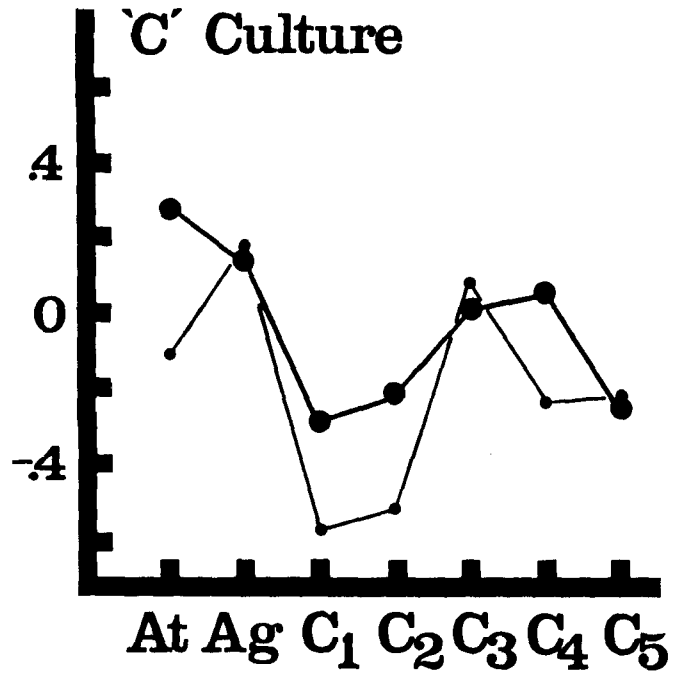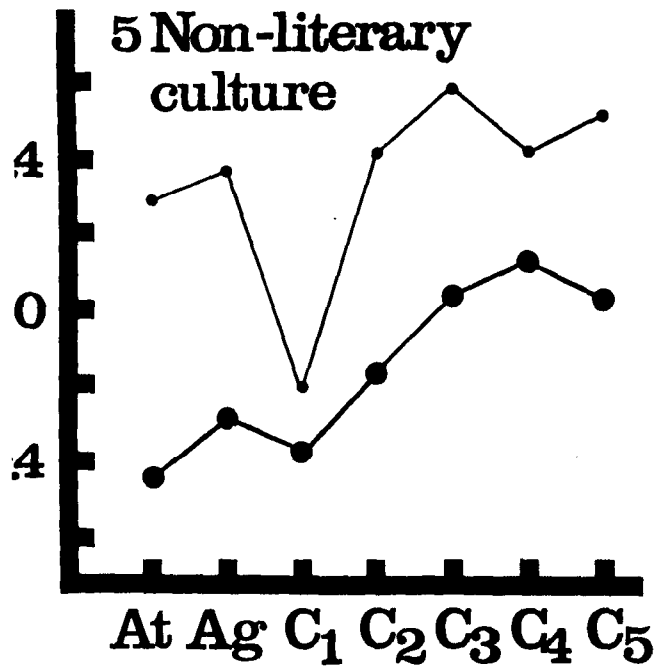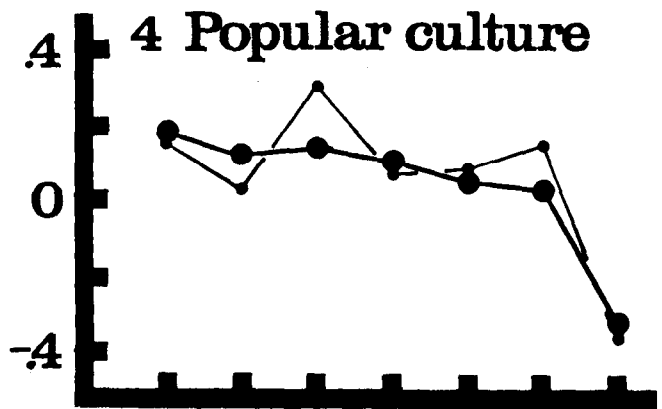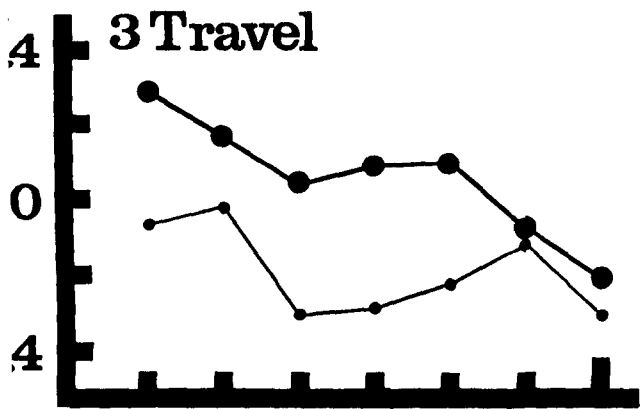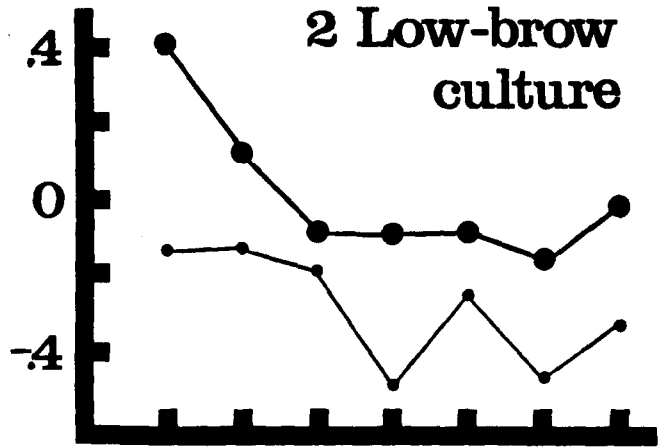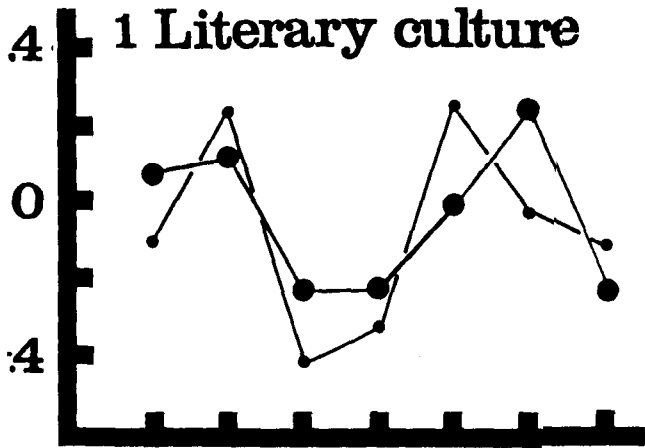
ure 13-2: Shows scattergrams of C:'Culture' (across page) with I:Libertarianism
wn page). An asterisk indicates a single subject, and ań integer between 2 and 9
icates that many subjects at the same point on the graph.

Birmingham
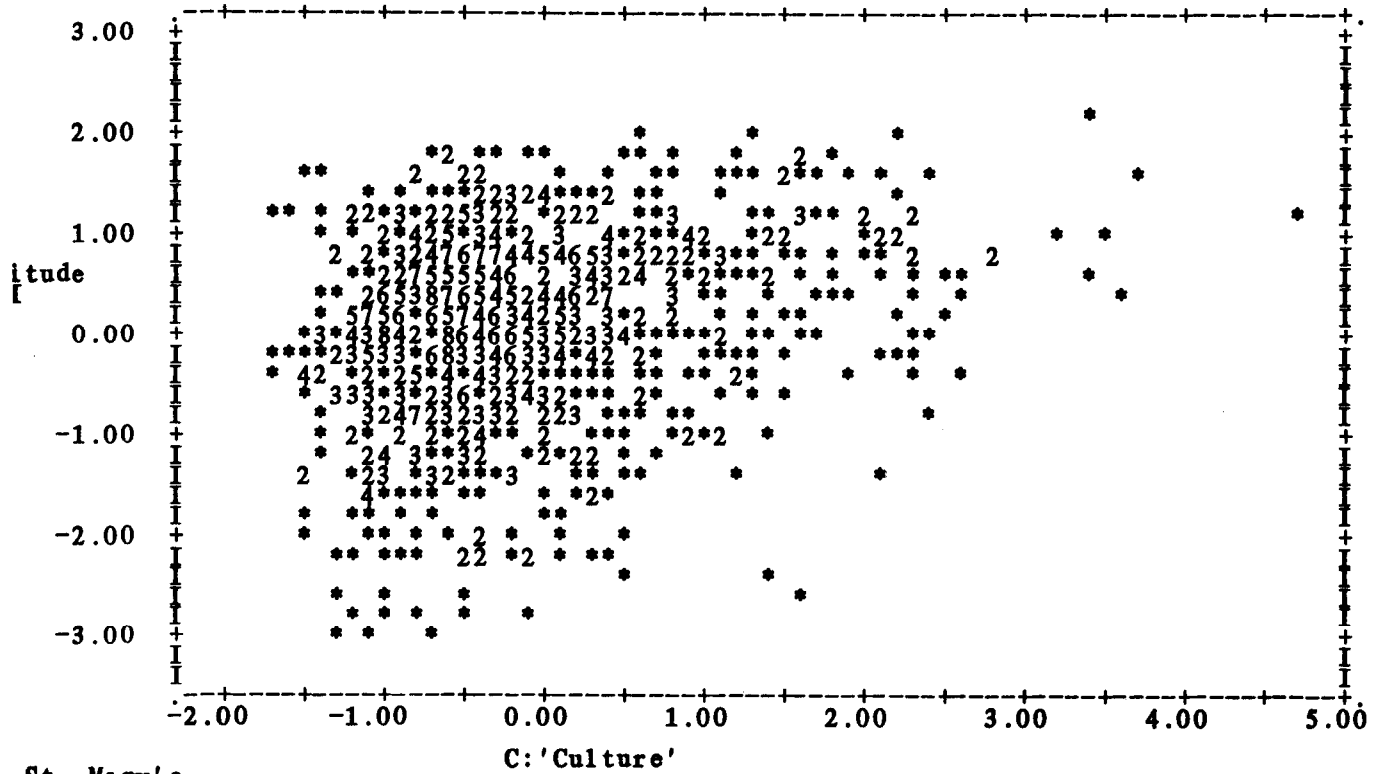
C:'Culture'
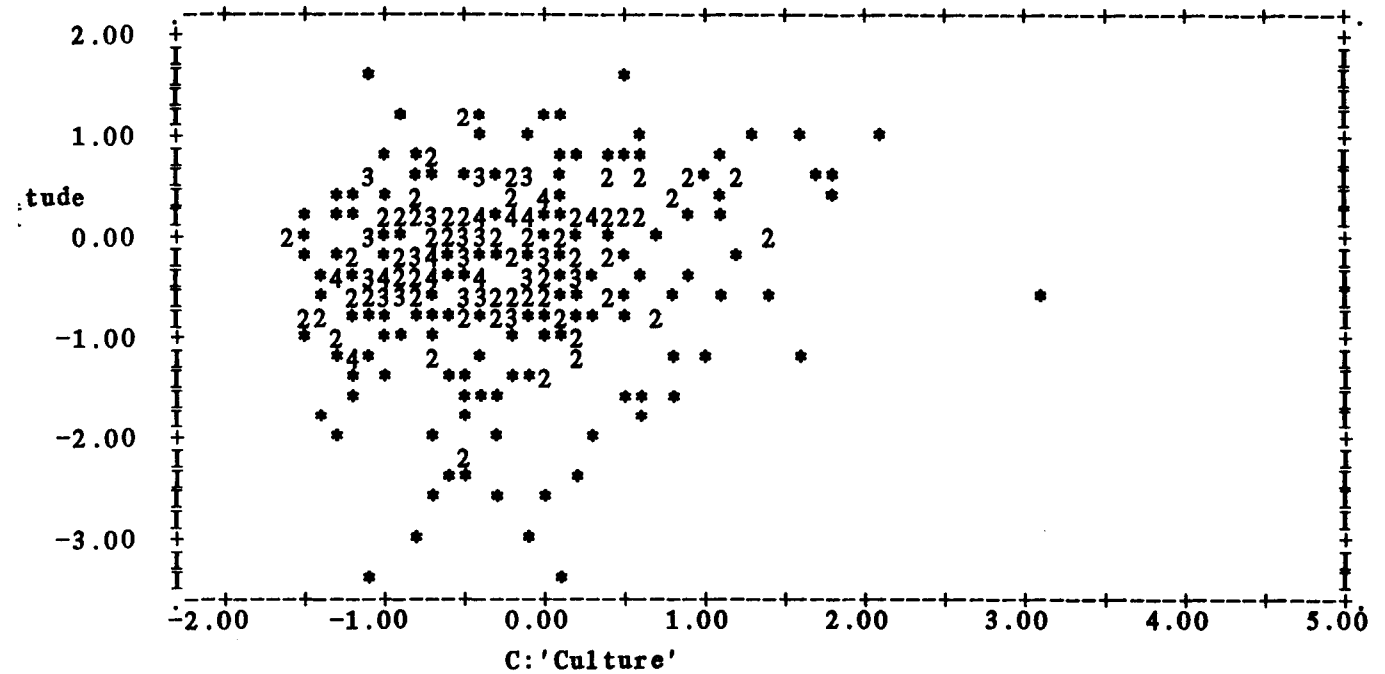
St. Mary's

C:'Culture'

ure 13-3: Shows scattergrams of C:'Culture' (across page) with II: Tough-mindedness
wn page).   An asterisk indicates a single subject, and an integer between 2 and 9
icates that many subjects at the same point on the graph.

Birmingham

II
itude

C:'Culture'

St. Mary's

II
titude

C:'Culture'
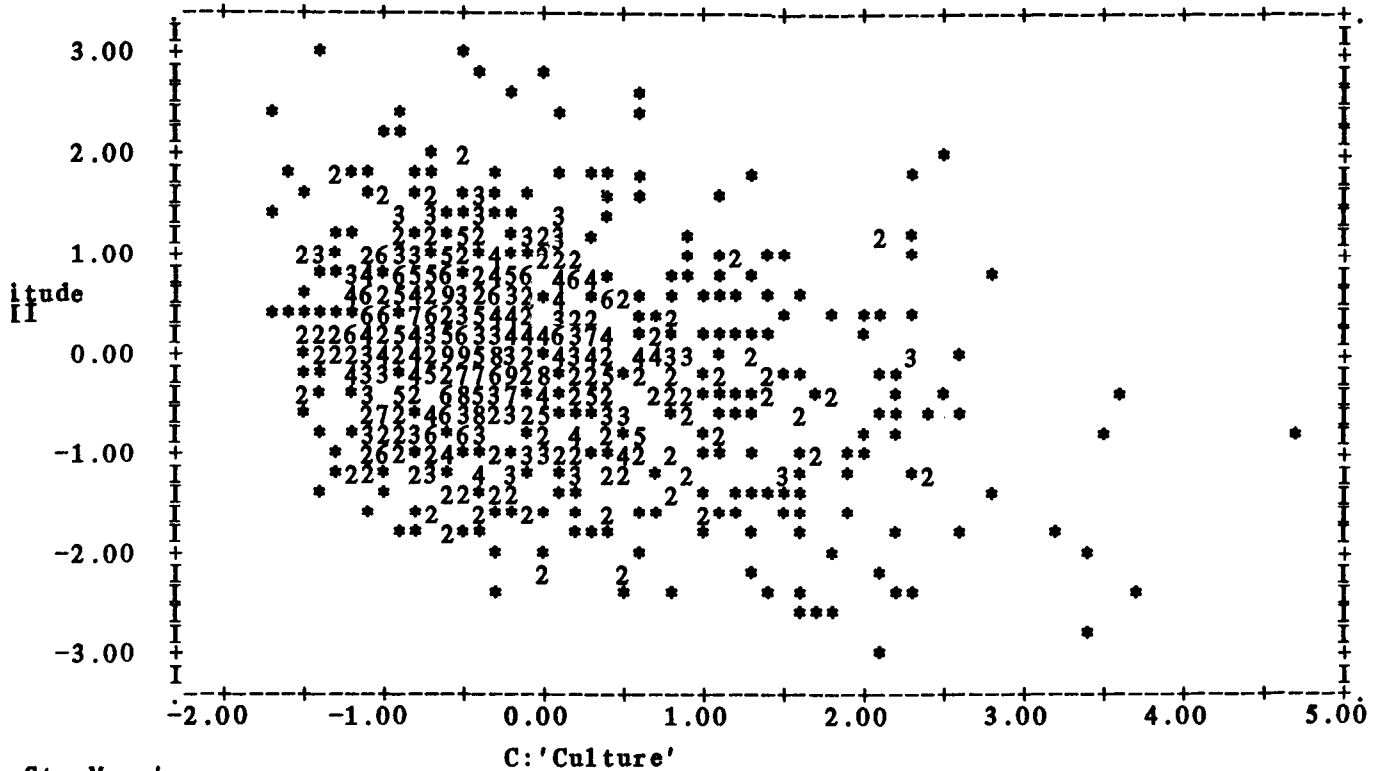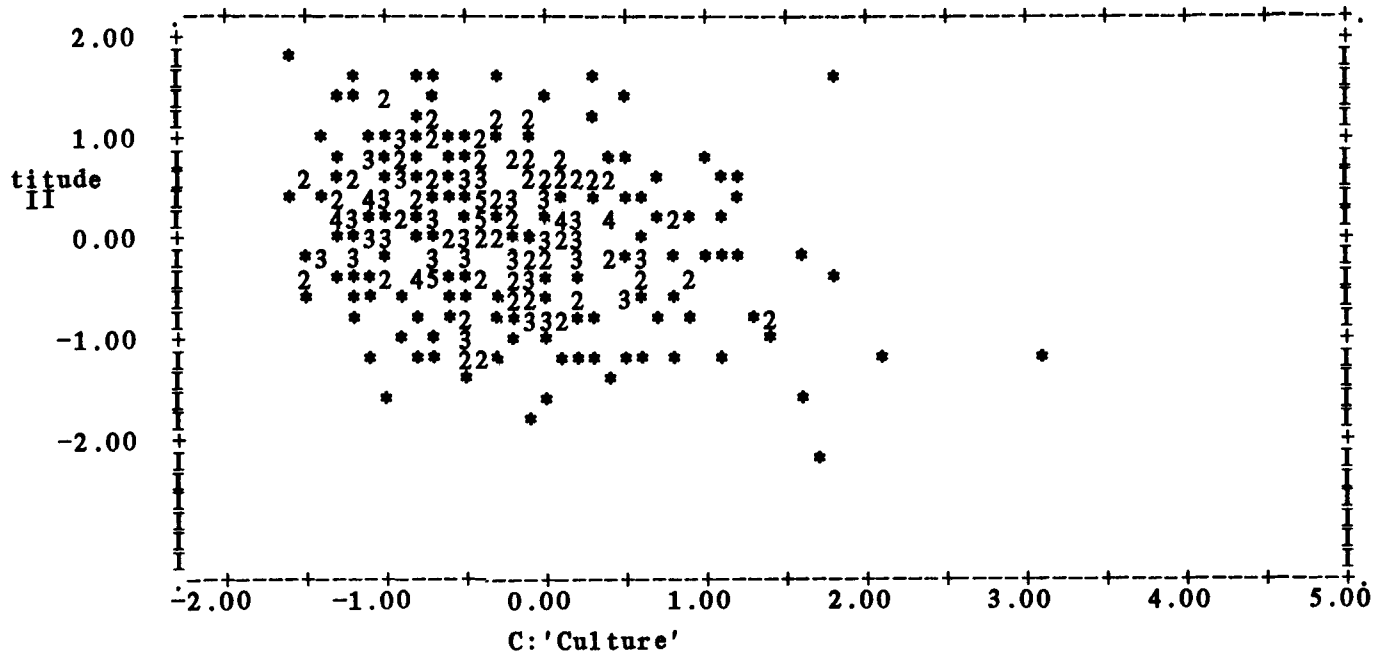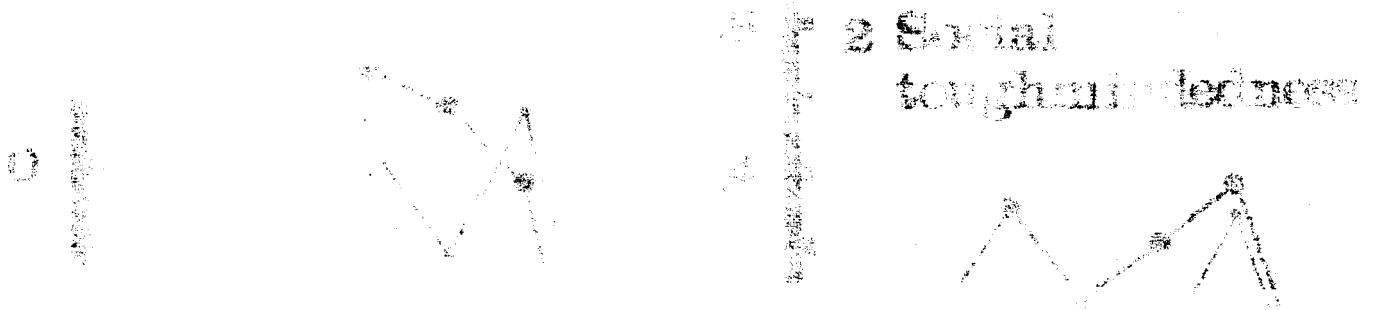
<u>Fi^gure 13-4.</u> Shows the mean score of individuals in each of the seven religious groups (abscissa) on the eight orthogonal attitude scales (figure 13-4a), and on the two super-ordinate attitude factors (figure 13-4b) (ordinates). The Birmingham and St. Mary's samples are shown separately, large dots indicating the Birmingham sample and small dots the St. Mary's sample. Sample sizes for each group are shown at the top of Figure 13-4b. It should be noted that the St. Mary's group of Christians who are non-church-attenders contains only eight individuals and should be interpreted with care. Significance levels for linear and quadratic trends are shown in table 13-2. Abbreviations: At: atheist;

Ag: agnostic; CI: Christian never attending church; C2: Christian, attending church on festive occasions only; C3: Christian, attending church 3-lox/year; C4: Christian, attending church about once a month; C5: Christian, attending church every week.

1 Vital libertarianism

2 Social toughmindedness

3 Liberalism

4 Personal libertarianism

5 Economic conservatism

6 Medical control

7 Sex education

8 General practice

123	225	40	84	123	82	210	Birmingham	●
33	55	8	34	31	39	104	St. Mary's	•

I Libertarianism

II Toughmindedness

At Ag C_1 C_2 C_3 C_4 C_5
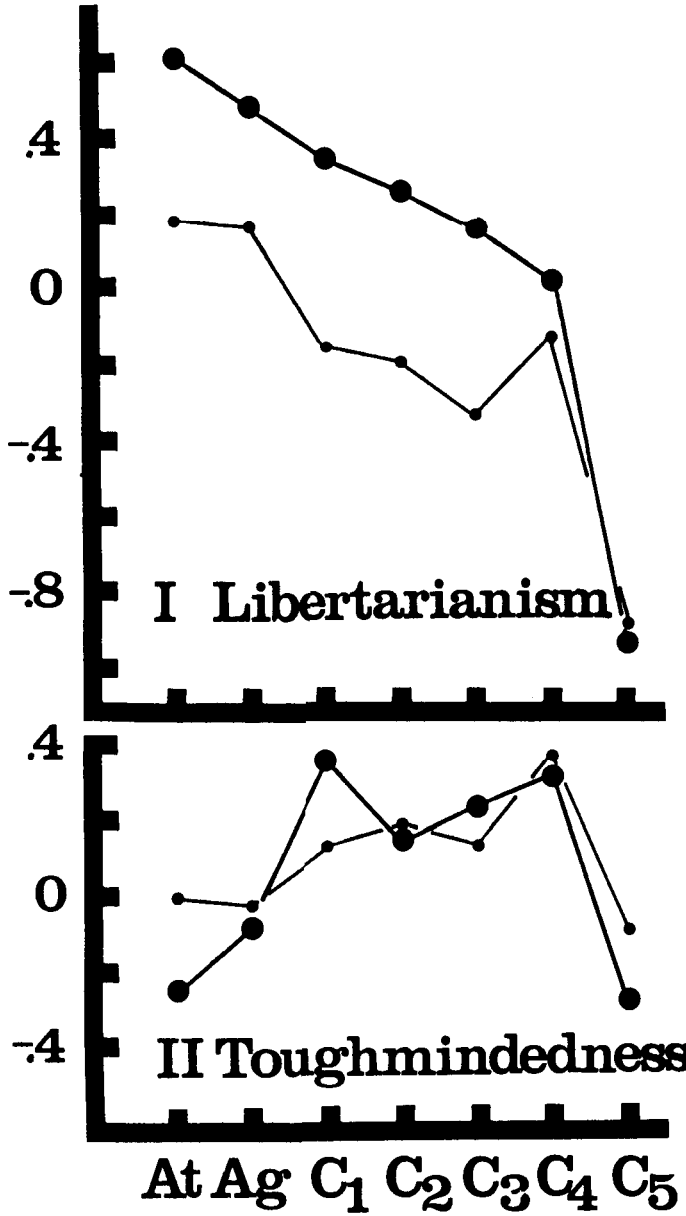
Figures 13-5 to 13-14_ Show the auto-, cross-lagged and synchronous correlations between each of the attitudinal dimensions, religion and the general C:'Culture' factor. Sample sizes are 153 for correlations involving religion and 190 for those not involving religion.

Figure 13-5.
Auto-, synchronous and cross-lagged correlations
Attitude-1 : Vital libertarianism

Figure 15-6.
Auto-, synchronous and cross-lagged correlations
Attitude-2 : Social tough-mindedness.
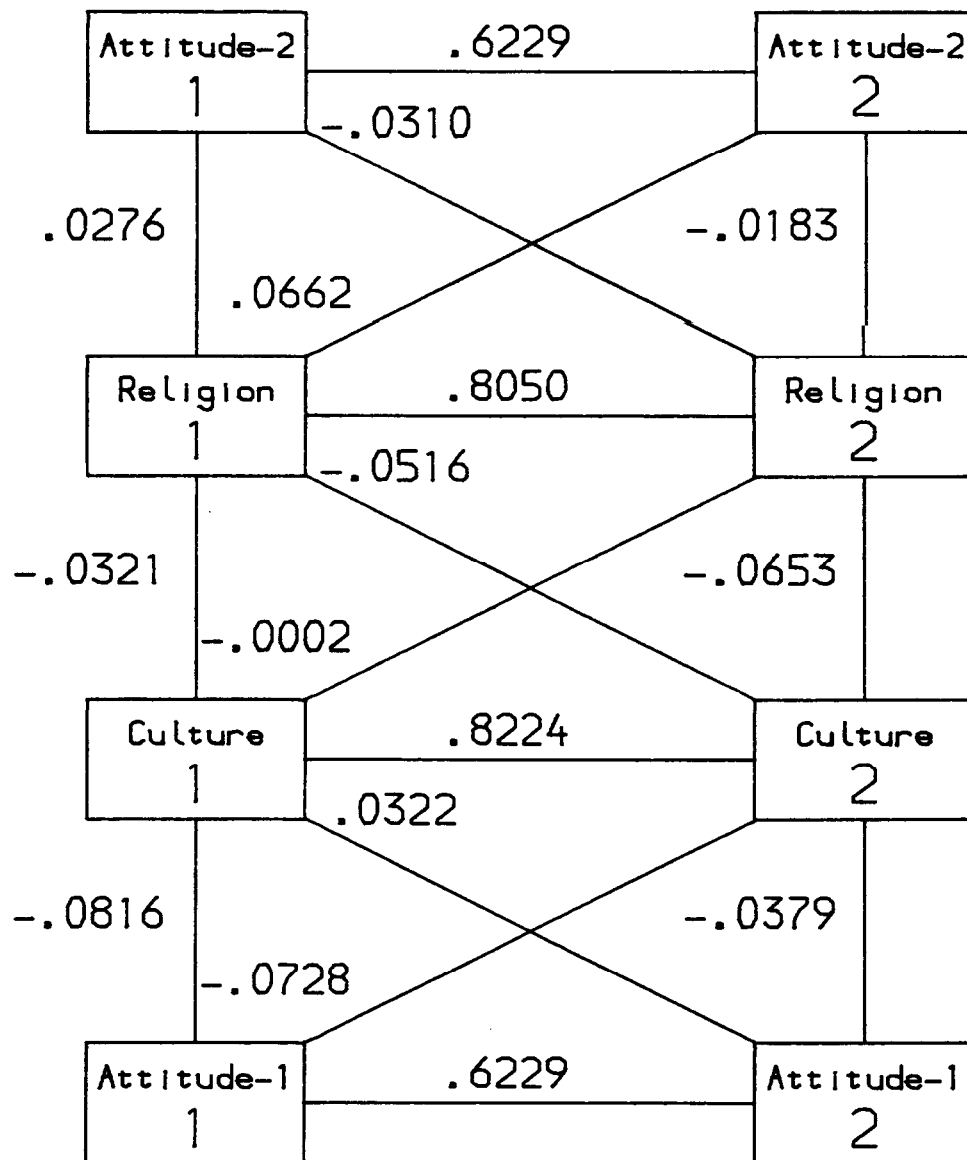
Figure 15-7.
Auto-, synchronous and cross-lagged correlations
Attitude-3 : Liberalism
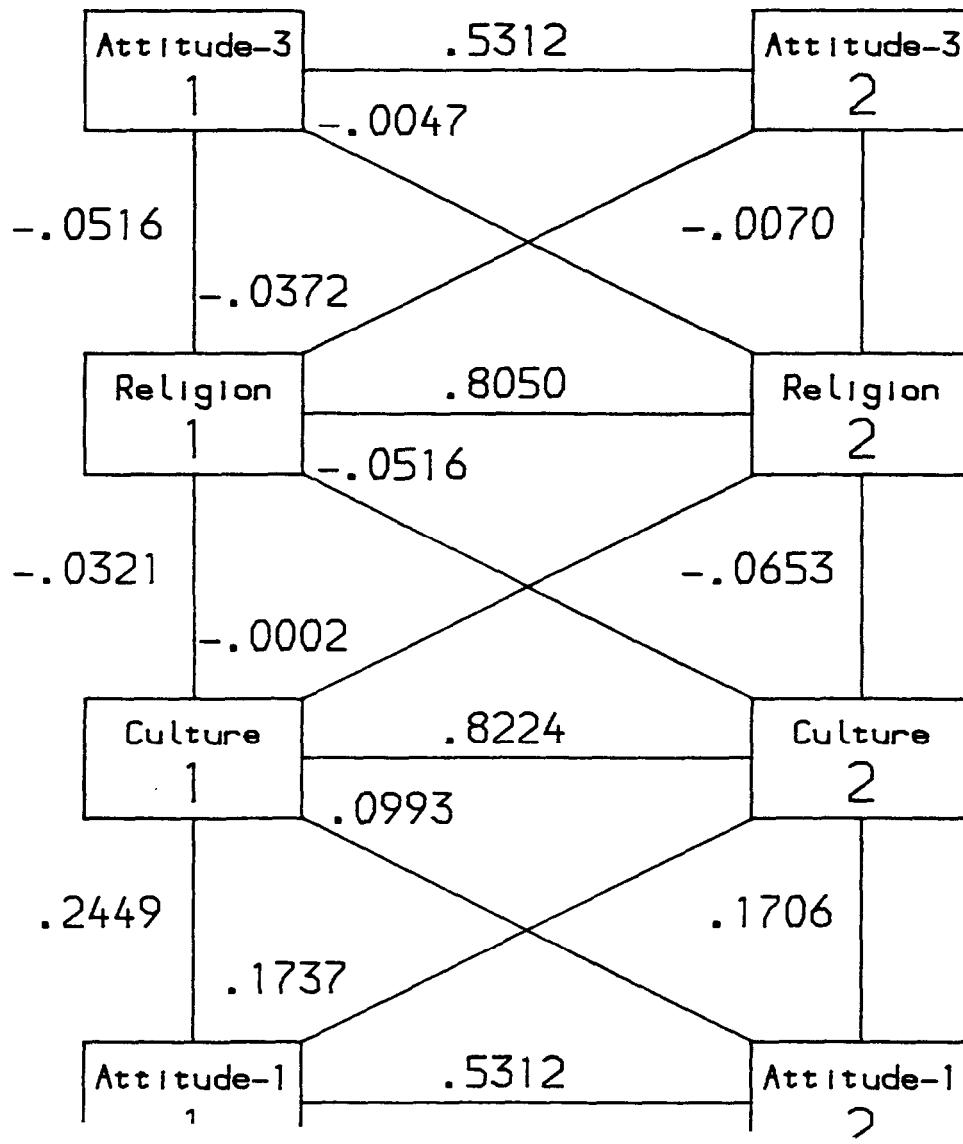
Figure 15-8.
Auto-, synchronous and cross-lagged correlations
Attitude-4 : Personal libertarianism
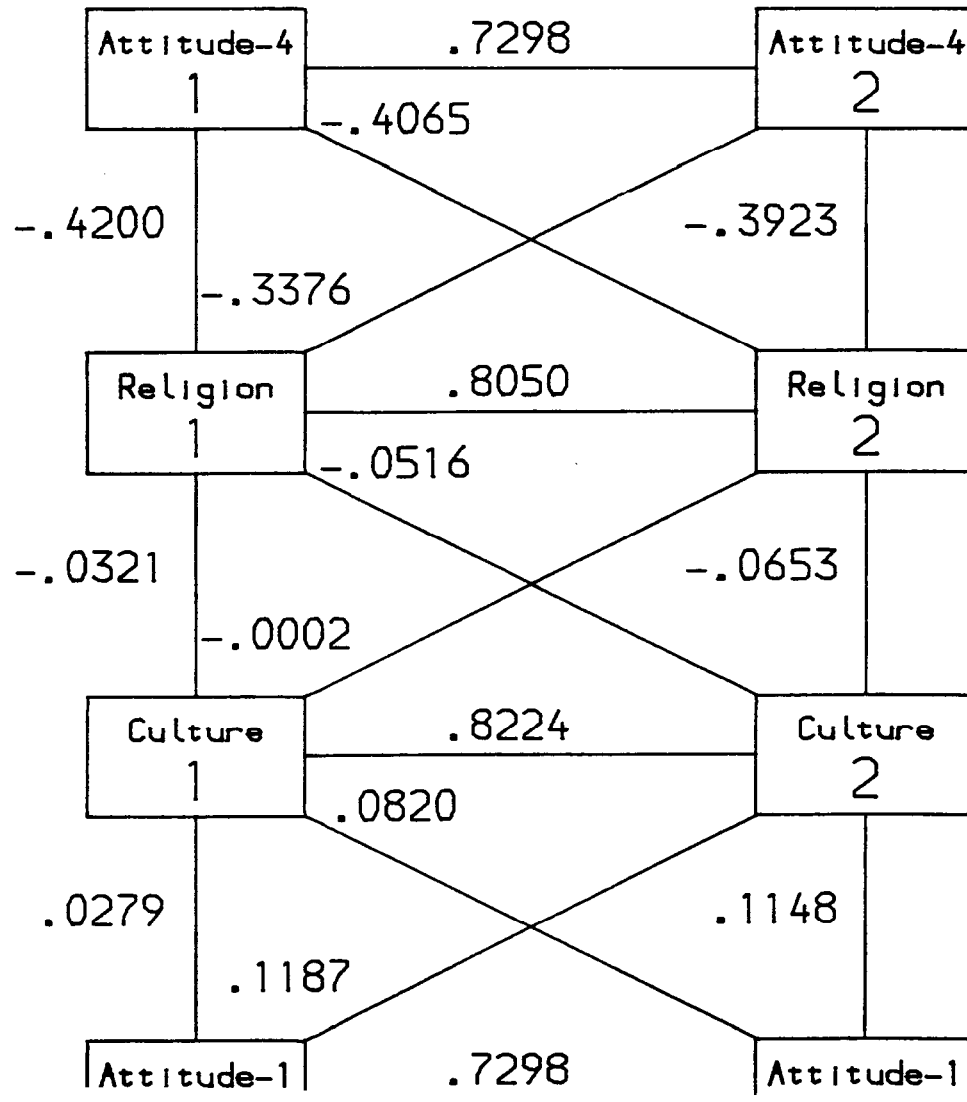
Figure 13-9.
Auto-, synchronous and cross-lagged correlations
Attitude-5 : Economic conservatism
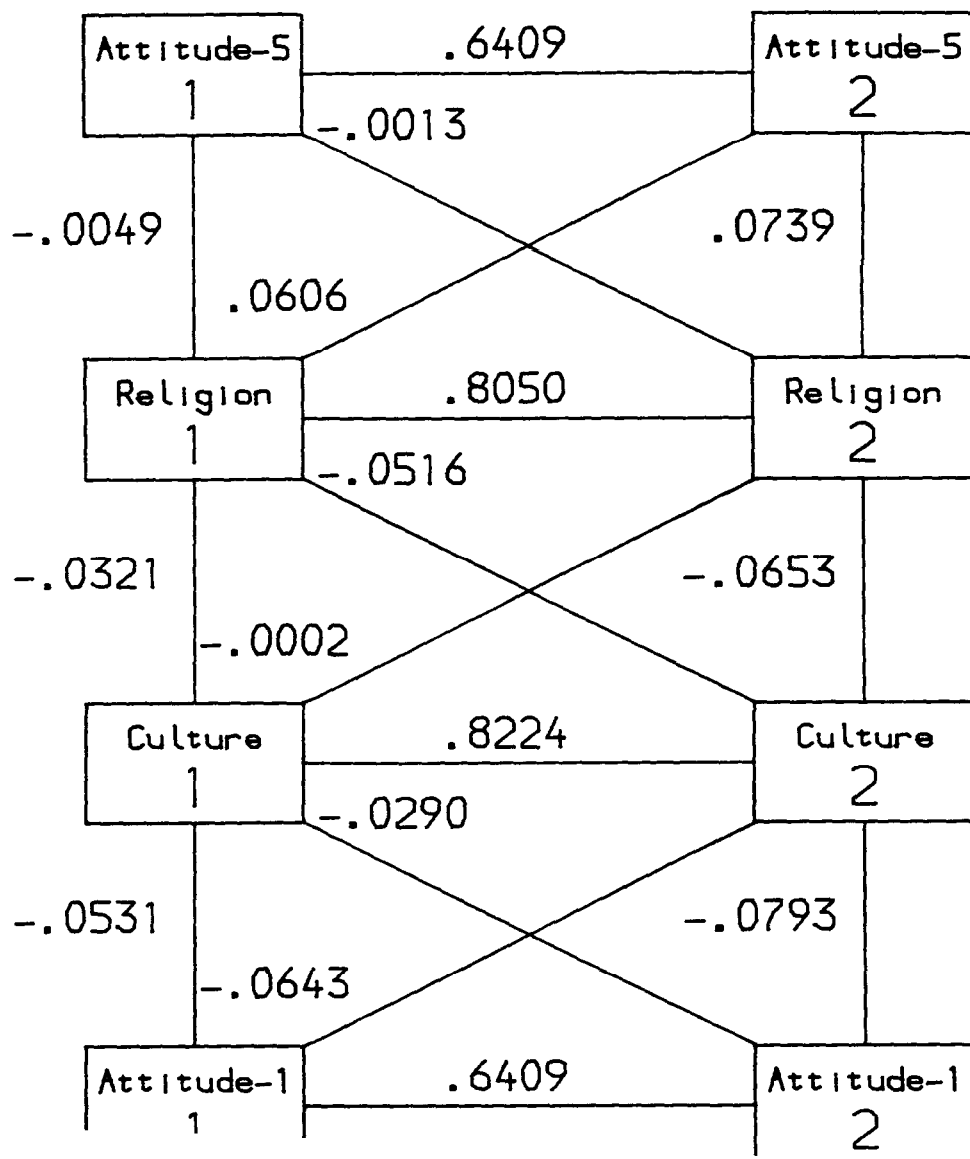
Significance testing
Synchronous   Cross-lagged

z=-0.993 NS   z=-0.779 NS

z= 0.501 NS   z=-0.773 NS

z= 0.373 NS   z= 0.500 NS

Figure 15-10.
Auto-, synchronous and cross-lagged correlations
Attitude-6 : Medical control
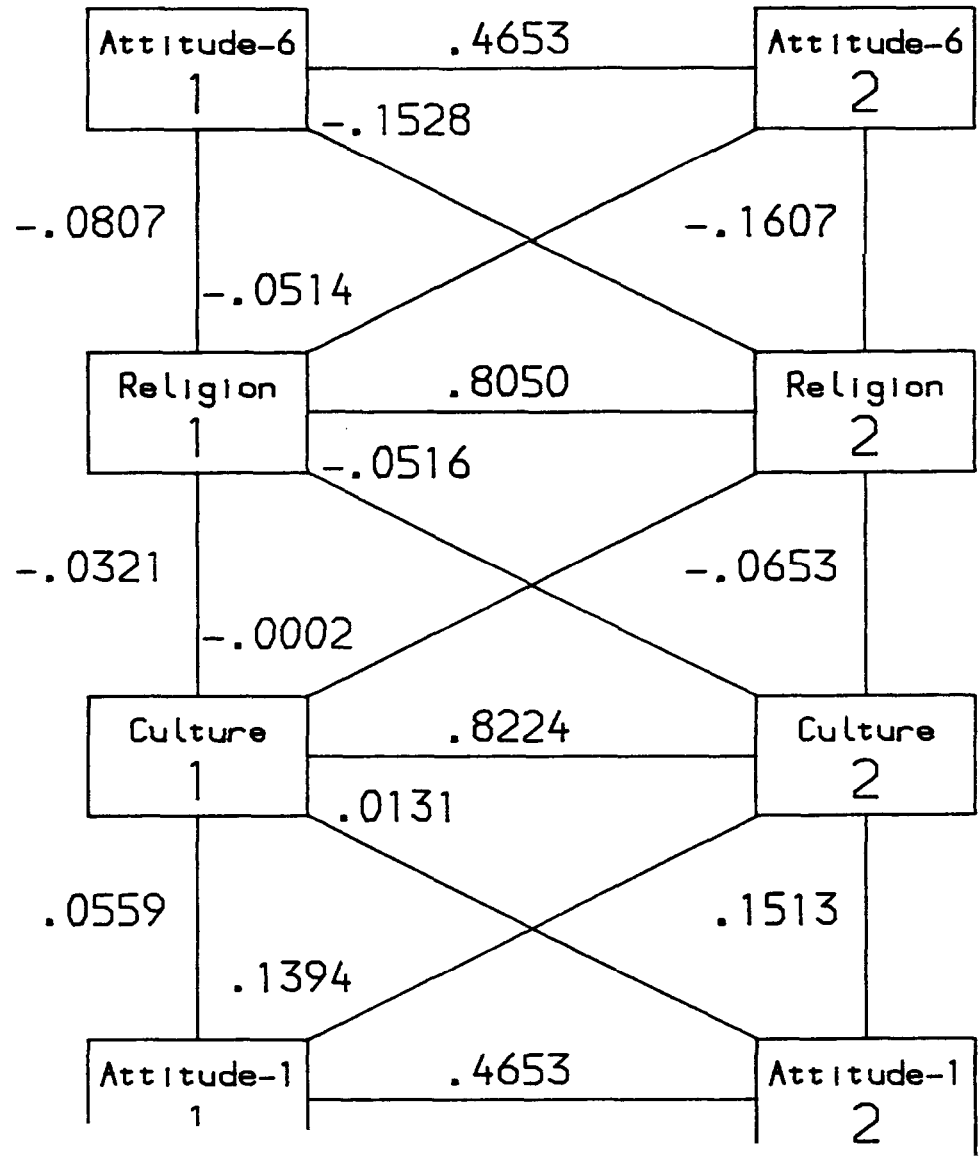
Figure 15-11.
Auto-, synchronous and cross-lagged correlations
Attitude-7 : Sex education
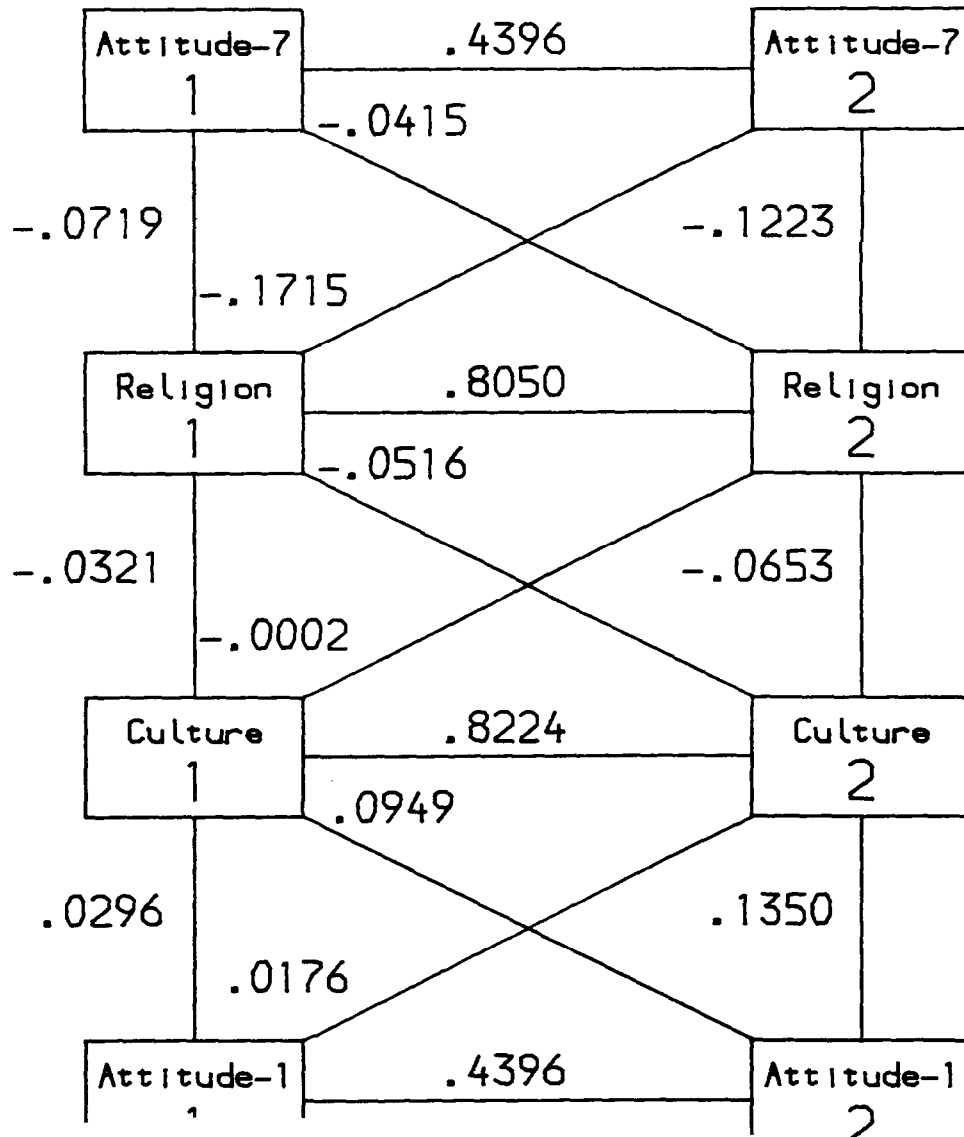
Figure 15-12.
Auto-, synchronous and cross-lagged correlations
Attitude-8 : General Practice
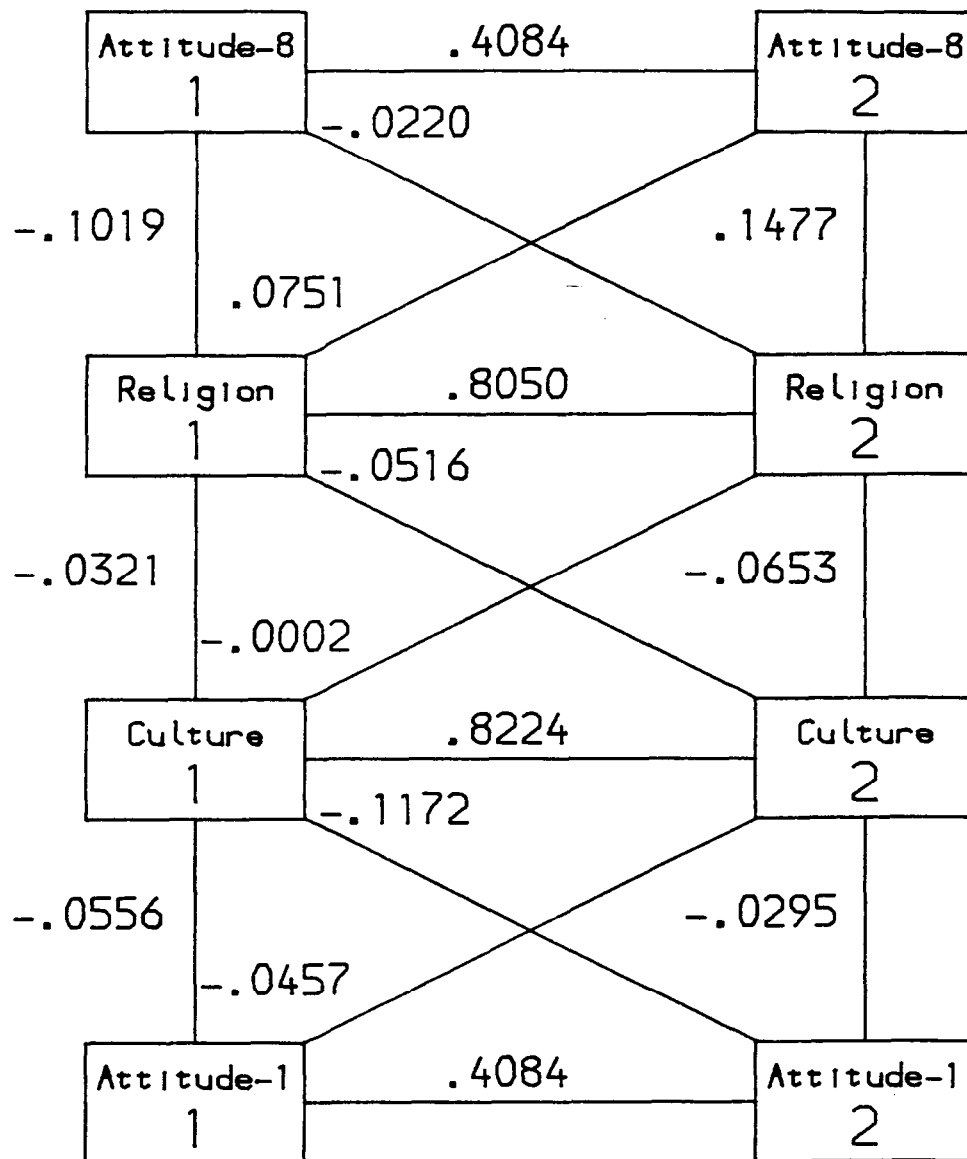
Figure 15-15.
Auto-, synchronous and cross-lagged correlations
Attitude-I : Libertarianism
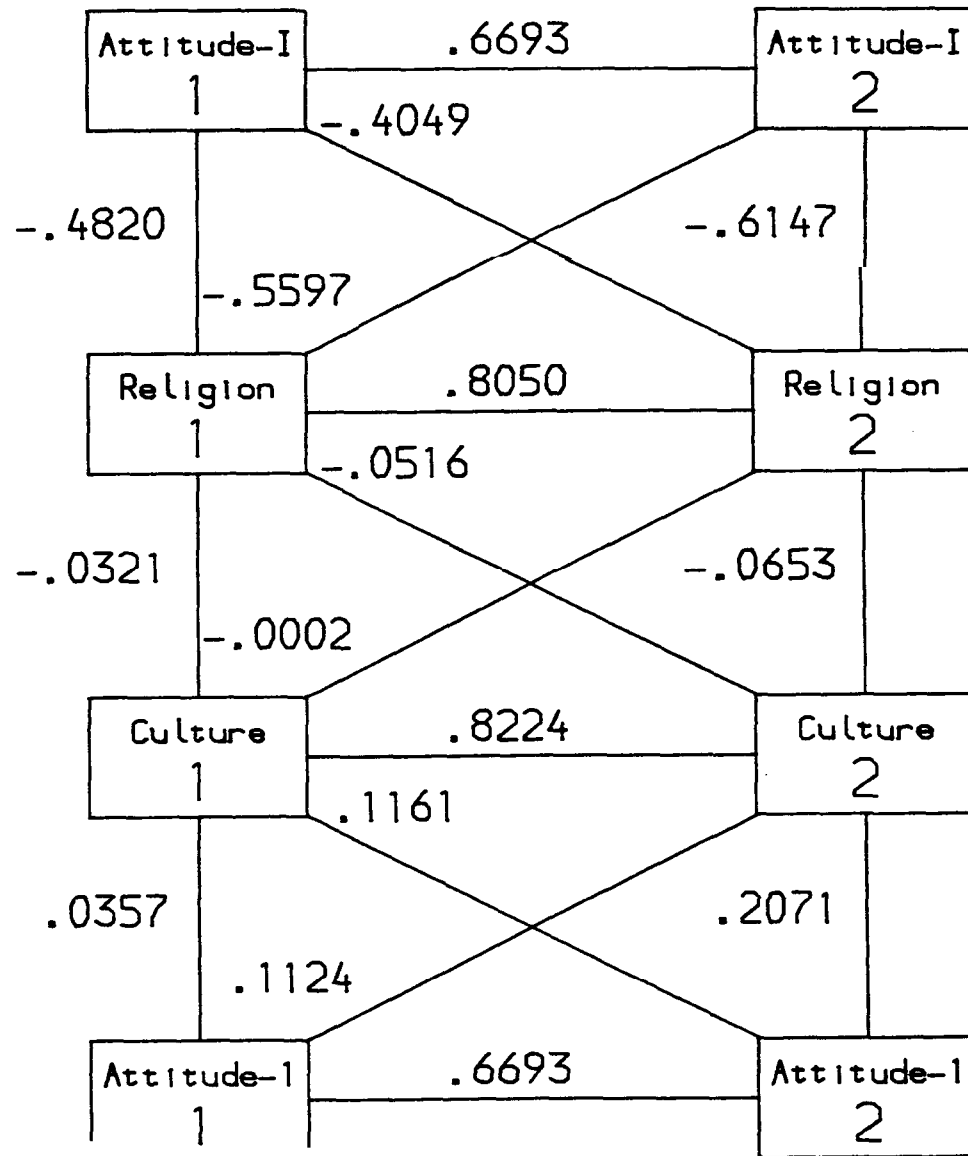
Significance testing

Synchronous	Cross-lagged
z= 2.241 *	z= 2.240 *
z= 0.501 NS	z=-0.773 NS
z=-2.546 *	z= 0.054 NS

Figure 13-14.
Auto-, synchronous and cross-lagged correlations
Attitude-II : Tough-mindedness

Significance testing

Synchronous	Cross-lagged
z= 0.776 NS	z=-0.611 NS
z= 0.501 NS	z=-0.773 NS
z=-0.658 NS	z= 2.402 *
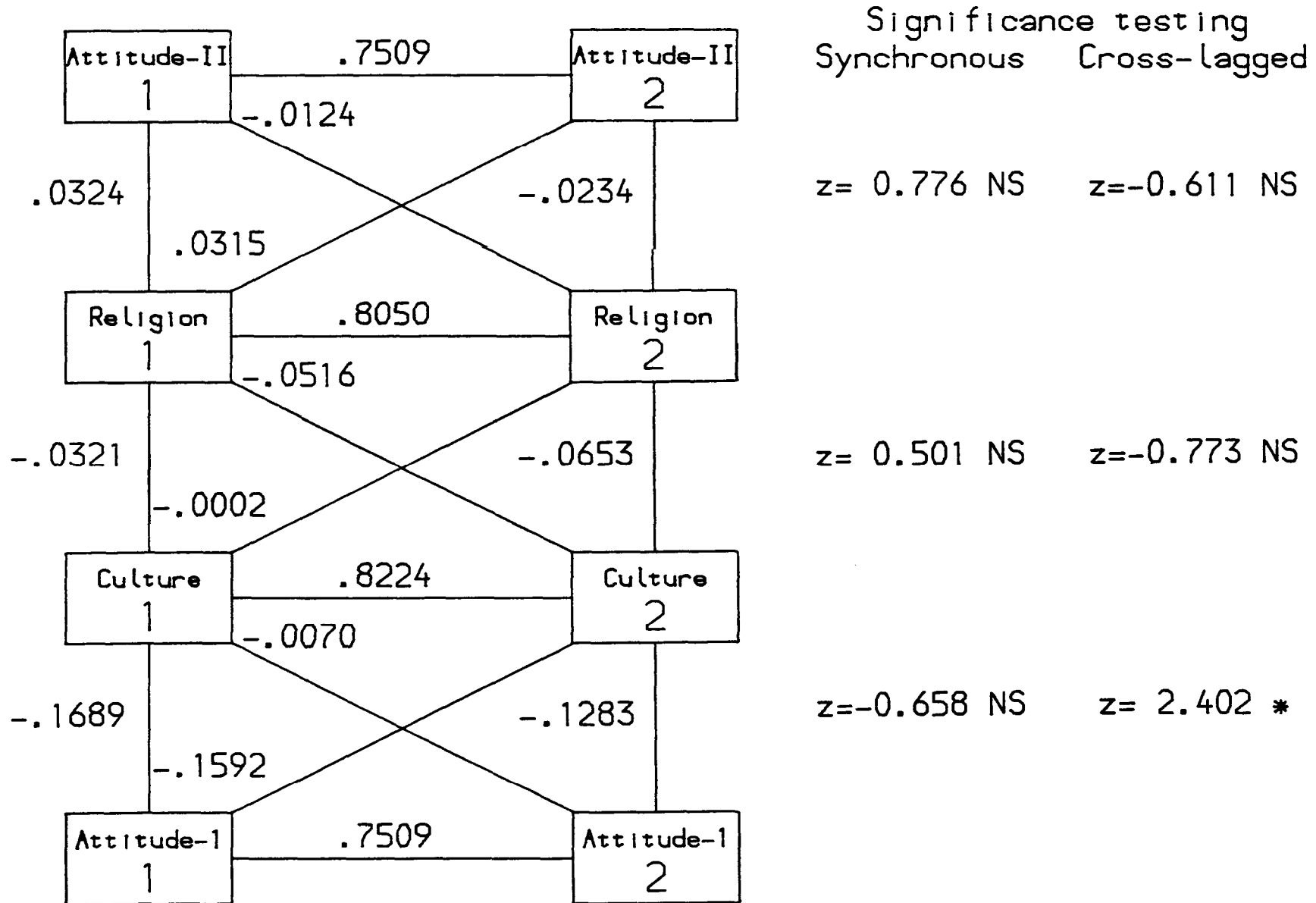
Table 13-1: Shows the correlations of the five orthogonal culture scales and the general culture scale, with the eight orthogonal attitude scales and the two super-ordinate attitude scales. The upper value in each cell is for the Birmingham sample (N=989) and the lower value is for the St. Mary's sample.

Culture dimensions

	1:Literary culture	2:Lowbrow culture	3:Travel	4:Popular culture	5:Non-literary culture	C:'Culture'
1:Vital libertarianism	.0916**	.0794*	.0798 *	-.0865***	-.0874**	.1102***
	-.0016	.1362*	-.0069	-.0960+	.0163	.0693
2:Social tough-mindedness	-.0569+	-.1013 ***	.0363	-.0898**	-.0141	-.0800*
	-.1300*	-.0661	.0250	-.1337*	-.0458	-.1240*
3:Liberalism	.1973***	.3172***	.2304 ***	.0153	-.1232***	.3556***
	.1242*	.2049***	.0748	.0019	.1123*	.2447***
4:Personal libertarianism	.1364***	.1652***	.1314 ***	-.2956***	-.2055***	.1735***
	.1167*	.0929+	.1955 ***	-.2254***	-.0882	.1619**
5:Economic conservatism	-.0089	-.2619***	.0018	-.1473***	.1139***	-.1273***
	.0559	-.1683**	.0766	-.1115*	.0431	-.0152
6:Medical control	.0596+	-.0172	-.0587 +	-.0999**	.0734*	.0148
	.1041+	.09754-	.0218	.0330	.1002+	.1549**
7:Sex education	.1192***	.0738*	.0081	.0361	.0608+	.1288***
	-.0030	.0658	.0308	.0866	.0165	.0527
8:General practice	.0250	-.0765*	.0198	-.0053	.0551+	-.0075
	.0375	-.0507	.0255	.0415	.0823	.0289
I:Libertarianimn	.2031***	.2152***	.1867 ***	-.2072***	-.1793***	.2706***
	.0793	.2067***	.1212 *	-.1842***	.0054	.1988
II:Tough-mindedness	.1426***	-.3286***	-.0680 *	-.1143***	.0862**	-.2755***
	-.1476**	-.2136***	-.0152	-.1614**	-.0603	-.2320***

Table 13-2: Significance levels of linear and quadratic trends, and of deviations from those trends, for the data of figures 13-1, 13-4a and 13-4b.
+: p<0.10; *: p<0.05; **:p<0.01; ***:p<0.001.

Culture Factor:	--Birmingham--			----St. Mary's--		
	Linear	Quad	Deviation	Linear	Quad	Deviation
1 "Literary culture"	**	-	***	-	-	***
2 "Low-brow culture"	***	***	-	*	-	-
3 "Travel"	***	-	-	*	-	-
4 "Popular culture"	***	**	—	***	*	—
5 "Non-literary culture"	***	-	+	+	-	-
C "'Culture'"	***	-	**	+	-	**

Ethical attitude Factor:	Linear	Quad	Deviation	Linear	Quad	Deviation
1 "Vital libertarianism"	***	***	**	***	*	**
2 "Social tough-mindedness"	-	***	**	-	-	*
3 "Liberalism"	***	+	-	+	-	-
4 "Personal libertarianism"	***	-	*	***	-	-
5 "Economic conservatism"	-	***	-	-	*	-
6 "Medical control"	-	-	+	-	-	-
7 "Sex education"	-	-	-	-	-	-
8 "General Practise"	*	*	-	-	-	-
I "Libertarianism"	***	***	***	***	*	**
II "Tough-mindedness"	-	***	*	-	*	+

<u>Conclusions.</u>

"We shall not cease from exploration

And the end of all our exploring

Will be to arrive where we started

And know the place for the first time".

T.S. Eliot, <u>Little Gidding.</u>

14: Retrospect and prospect.

"It is largely by a student's later career that the merits of his education must be judged."

Robb-Smith (1966).

"A cynical friend of mine remarked that the study of medicine is a pleasant way to pass the time until the undergraduate is sufficiently mature to become a doctor."

Rhodes (1976)

II … the time has come for long-term prospective research into the validity of selection of entrants to medical school".

Richardson (1980; p.356)

"In 1869 ... Paget and two of his colleagues drew on personal knowledge of 1000 students ... who had passed through their hands between 1839 and 1859. Of this 1000 they estimated that 23 achieved distinguished success, 66 considerable success, 507 fair success, 124 very limited success, and 56 failed entirely. Also ... 96 left the profession, 37 died within twelve years of starting practice, and 41 died during pupillage. Galton (1889) ... indicated the

range of talent found in this group of doctors:
   '... towards the foremost ... stood the
   three Professors of Anatomy at Oxford,
   Cambridge and Edinburgh ... towards the
   bottom of the failures lay two men who
   committed suicide under circumstances of
   great disgrace, and lowest of all [was]
   Palmer, the Rugeley murderer, who was
   hanged.'"

<u>Summary.</u>

The broad findings of the thesis are reviewed, their implications for medical schools are discussed, and the prospects for future research are outlined.

The problems discussed in this thesis are amongst the oldest in medicine. In <u>The Canon,</u> which describes the characteristics desirable in a student of medicine, Hippocrates suggests that,

> "For a man to be truly suited to the practice of medicine, he must be possessed of a natural disposition first, [and] the necessary instruction [and education"

<div align="right">Lloyd (1978; p.68).</div>

Hippocrates leaves unanswered the major question, of the greater importance of a natural disposition or of education. In a previous thesis (McManus, 1979) I argued that its major questions could be construed as what A.N. Whitehead called 'footnotes to Plato'. The present thesis may be similarly construed, as an antagonism between Plato and Aristotle, over the relative importance of education in determining virtue or character. Plato argued that education had little influence; "virtue will be acquired neither by nature nor by teaching, whoever has it gets it by divine dispensation" <u>(Meno,</u> 100.a) (see also Pence, 1983). In contrast, Aristotle takes a more biological and environmentalist line, attributing greater influence to social factors; "Goodness of character ... is the outcome of habit ... no form of goodness of character is produced in us by nature" <u>(Ethics,</u> II.1, 5; Burnet, 1903, p.44). The satisfaction of the demands of Hippocrates for men "truly suited to ... medicine" (and who presumably would subscribe to the strict ethical code which he required) would therefore be resolved differently according to whether one preferred to believe Plato or Aristotle.

After setting the problem in perspective, we may now humbly try to provide some sort of answer to the questions raised by Munro (1981), which are also of course the questions of the ancients, when it is asked whether "selection or training is at fault?".

In a different context from the present one, Elstein <u>et al</u> (1978;p.3) have described how our knowledge of diagnostic skill, "was based on everything but systematic empirical studies ... [t]he literature [comprising] admonitory papers detailing how clinicians <u>ought</u> to do their work, fortified with anecdotes provided by distinguished physicians". Medical education is in a similar position, studies frequently containing a multiplicity of ex <u>cathedra</u> statements with little attempt at basing these on systematic enquiry (e.g. Walker, 1965; Sinclair, 1972; Pickering, 1978; Roddie, 1984). It need hardly be said that the view of this author is that empirical study is essential in evaluating medical education, and in making proposals for change.

The process of student selection is seen in this thesis as being relatively passive. To a large extent the students accepted are a fair selection of those who apply, with the important exception that acceptances have far higher A-level grades than rejects; otherwise they have pretty well the same background, hopes, aspirations, attitudes and interests as rejects. Nevertheless it is clear from chapters 2 to 7 that selection as a total process is far broader than a mere consideration of selection <u>by medical schools</u> would suggest. Medical students are a highly select group in terms of their origins and background, as are medical school applicants in general, and they are select because to a great extent they are self-selected. In choosing even to contemplate applying to medical school, applicants are an exclusive group, with their exclusivity determined partly by intellectual factors, and partly by other factors such as schooling and class, which both encourage an applicant to believe that they have a realistic chance of entering medical school, and provide the educational resources to ensure that they then gain the crucial A-levels to win a place in stiff competition. However it is those same background factors which can be shown to

influence the attitudes of applicants (see chapter 9), and which imply that their attitudes might well be substantially different from a comparison group without that particular social composition. The hypothesis deserves to be the subject of a future study, although the logistics of its testing would be formidable. How medical schools might change their selection to take account of such factors (assuming that they did indeed wish so to take account) is also difficult to know. It would require secondary schools to be encouraged to treat a wider range of their pupils as being potentially suitable for medical school admission. But in so doing it would encourage a greater number of applicants to be disappointed in their career choices. As yet we know almost nothing about the effects on school-leavers of pushing their aspirations towards medicine, and subsequently disappointing those aspirations; so that they perhaps make a repeated application to medical school the next year, with yet further failure and evential subsequent entry to another science or para-medical university course, perhaps two or even three years behind the peer group to which they once belonged. Whether thwarted ambition leaves them eternally frustrated, or they are sufficiently adaptive and responsive to take such blows in their stride is simply not known. It is a question which it is hoped will be answered in the future by studying the rejects in the St. Mary's study, three or four years after their initial rejection.

Once a student has arrived at medical school then the analysis of chapters 8 to 13 suggests a number of substantial changes, which are reflected, albeit often indirectly, in the measures of attitudes, culture and religion which have been described. Some of these changes, such as in specific attitudes can be shown, as in chapter 9, to be specific consequences of the medical training that the student receives. Many other changes, such as in other attitudes, culture or religion are

actually occurring <u>despite</u> the medical training that the student receives, and are either a consequence of a direct maturational process, as immature adolescents pass into young adulthood, or perhaps are idiosyncratic responses on the part of the student to life events unique to themselves. And of course these changes are inter-related one with another in a causal fashion. Chapter 13 suggested that at least two of these causal influences could be teased apart; it is change in the religious values of students which makes them more libertarian, rather than vice-versa, and it is change in tough-minded attitudes which causes change in cultural interests, rather than vice-versa. However the majority of changes that are occurring in student attitudes still remain unexplained. Once more we must accept that although medical schools do have measurable effects upon the attitudes and the behaviours of their students, they are in many respects, relatively passive institutions, through which students can pass without being unduly influenced. It is probably as erroneous to over-estimate the effects of training upon attitudes as it is to under-estimate it. The Birmingham study, upon which most of the above conclusions are based, was not extensive enough to ask a range of more subtle questions about the effects of medical schooling. The St. Mary's selection study found that factors such as schooling and social class were related to attitudes in applicants. An important question concerns whether students from different social backgrounds respond in different ways to the effects of medical training. A planned follow-up of the St. Mary's sample when they are in their final year, in 1986, will allow answers to such questions, due to its greater size. The follow-up should also be able to tell us whether different medical schools have detectably different effects upon the attitudes of their students, after taking into account differences in attitudes on entry to those schools. Certainly medical schools conventionally believe

that their graduates have a perceptibly different 'flavour' to the graduates of other medical schools. A final unanswered question about the influence of medical schools concerns its specific role as a <u>social</u> institution. The analyses of chapters 8 to 13 make the implicit, quasi-physicalist assumption that the effects of a school upon a student may be detected independently of the effects of that school upon other students in the school. However the school in some strict sense is the other students. A more sophisticated social interpretation of a medical school would note that students as a group are not homogenous, but rapidly clump together into smaller social groups, which often live, work and play together. In so doing they may influence one another in very important ways, such that the changes occurring in a student might well be different had he been educated at the same school at the same time with the same fellow students but with different particular friends. Whilst such effects are very likely, and are attractive theoretically, their detection in social systems by observational means alone is difficult, if verging on the impossible. One possible methodological approach might be to examine the St. Mary's sample at follow-up and ask then to list their closest associates in the medical school, so that a sociogram of the nexus of social inter-relations may be constructed, and the relative influences of such groupings upon behaviour then determined.

A further deeper set of questions to be probed by a subsequent study concerns the reasons for changes in attitudes. Merely to *say* that change in religion causes some changes in attitudes, is only to push the questions one stage further back. The important work of Kohlberg (e.g. 1964), following in the tradition of Piaget (1931), has emphasised that the cognitive processing of moral rules occurs in different stages, or levels of processing. Thus change in ethical behaviour might occur because of a change in the premises within a particular level, or be due

to a cognitive re-working of the same premises at a higher level. Such models should now be distinguishable by the easily administered moral reasoning tests of Rest (1979), and these will be included in further follow-ups, and in the initial stages of subsequent cohorts. Small studies by Goldman and Arbuthnot (1979) and Givner and Hynes (1983) have suggested that such an approach will be useful. The follow-up study will also ask questions about more specifically medical issues than can be asked in a questionnaire designed for medical school entrants, and will also be extended to cover a deeper analysis of religious issues, since these were found to be of greater importance than initially anticipated in the present study, and better techniques will be used to analyse the nature of religious beliefs along a number of dimensions (Piazza and Glock, 1979; Roof, 1979).

The one question the present studies have been unable to answer at all is the one raised in the Introduction: Do the attitudes of medical students bear any relationship to their subsequent clinical practice, either in the general sense of determining the specialty they enter, or in the highly specific sense of affecting the details of their interactions with patients or in their therapeutic or other practice decisions? That question is simply unanswerable at present, there being no adequate empirical data. The St. Mary's study does however form the basis for such a prospective study, since it is simply necessary to wait an adequate amount of time and then re-assess the students, by then long-qualified, and see whether attitudes on entry to medical school relate to clinical practice. 'Simply' is of course a gross understatement. One will in fact have to wait until the students have reached, say, their mid-forties, by which time they will have well-established careers and practice habits; such a study will have to wait until nearly the end of the first decade of the next millenium

(although of course preliminary studies could be carried out before that time). There is also the difficult of measuring practice itself - is it practical to study actual doctor-patient interactions, or diagnostic decisions, or therapeutic judgements? And how does one determine who are the 'good' doctors (or to use Munro's term, the 'right' doctors and the 'wrong' doctors), particularly as Bain(1984) has pointed out that quantity of care is far easier to measure than quality of care? But such questions are not unanswerable, and such measurements are not impossible, given thought and analysis, as Paget showed over a century ago (Paget, 1869). This is particularly so if the questions are reversed, and we ask "who are the 'bad' doctors?"; those GPs, for instance, without even steriliser, speculum or scales in their surgeries (Heath, 1984) would surely fit into that category on any scaling. The St. Mary's study lays the foundations for a large-scale prospective study of medical student selection so that one may hope to answer the question Abernethy posed "as if with painful doubt" to his introductory anatomy class at St. Bartholomew's Hospital in the early nineteenth century; "God help you all! What will become of you?" (Paget, 1869). It is an exciting prospect.

<u>References.</u>

"'or always roaming with a hungry heart

Much have I seen and known..."

Tennyson, <u>Ulysses.</u>

"People ask if I have myself read all the

books I quote - I reply that I have not;

it would certainly have meant spending my

life reading very bad books... but I did

not use a single passage without reading

it myself in the book quoted, going into

the context involved, and reading the

passage before and after it, to avoid all

risk..."

Pascal, <u>Pensees.</u>

Figures in square brackets after references indicate the page in the
text where they may be found.

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        model for government action", New England Journal of
        Medicine, 310, 627-632. [18]

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"We must be still and still moving

Into another intensity

For a further union, a deeper communion

Through the dark cold and the empty desolation,

The wave cry, the wind cry, the vast waters

Of the petrel and the porpoise. In my end is my beginning."

                          T.S. Eliot, <u>East Coker.</u>