

Mapping medical student career preferences

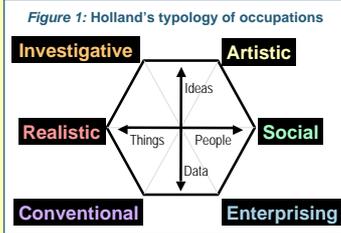


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Introduction

All doctors specialise after they have qualified, choosing a clinical speciality. The process though has been little studied, despite being important for planning health services.

Even before qualifying, medical students have preferences for different specialities before an actual choice is made.

Research into career choice in general finds there are three broad processes:

Mapping of careers. Occupations can often be represented in a two-dimensional space which is a cognitive map. Holland's popular typology groups professions into the six categories in figure 1: Realistic - Enterprising - Conventional; abbreviated to RIASEC (Holland, 1973; Prediger, 2000).

Circumscription. In making a career choice, people narrow down the range of careers to those which are appealing to them, the process Gottfredson (1981) calls *circumscription*.

Compromise. If a person is not properly qualified, has inappropriate experience or lacks talent, or too few posts are available, then a *compromise* has to be made between the preferred and the possible.

The present study concentrates on the first important stage of career choice, which is *mapping*. We use multidimensional scaling of medical student career preferences to produce a cognitive map of medical specialities, and we assess how these may change during medical training.

Method

Medical students. Medical students completed a questionnaire using a five-point scale to indicate their interest in a range of medical careers.

Students, who were at all UK medical schools, were taking part in one of three large-scale longitudinal studies of medical student selection and training (McManus et al, 1984, 1989, 1995).

Preferences were elicited for twenty-seven specialities, although some of the earlier studies had slightly different lists of specialities.

General public. An age and sex stratified sample of the general public was asked about their preference for a range of careers based on Holland's RIASEC categories (figure 2), as well as for Surgery, Anaesthetics, Hospital Medicine, and Psychiatry.

Statistical analysis.

Multidimensional scaling used INDSCAL in SPSS v10.0. The groups in the analysis comprised all combinations of age (younger vs older) and sex (male vs female).

Individual Differences SCALing (INDSCAL) is a special case of multidimensional scaling (MDS), designed for the analysis of individual differences in the ways in which subjects, or groups of subjects, perceive a set of stimuli. INDSCAL performs two distinct, but interrelated, analyses.

First, it arranges the stimuli in a 'master' space, and second, it estimates the weight that each subject, or group of subjects, allocates to each dimension of the 'master' space.

A specific advantage of INDSCAL is that it produces dimensions that are uniquely defined, fixed, and non-invariant under linear transformations.

Results

In each analysis the INDSCAL stress plot suggested two dimensions were sufficient to describe the relationships between careers.

General Public. Figure 2 maps the non-medical careers and shows Holland's RIASEC system clearly. Because INDSCAL extracts axes which are not arbitrary to rotation, this analysis provides evidence that one primary axis of the RIASEC hexagon runs from Realistic to Social (R-S), with the orthogonal axis running from Investigative and Social (I&S) to Conventional and Enterprising (C&E).

Medical students. Figures 3 to 8 show the INDSCAL maps for each set of medical school applicants and final year students. To show the similarities of the maps we have highlighted six specialities in colour (Surgery, Hospital Medicine, Psychiatry, Public Health, Administrative Medicine and Laboratory Medicine). The six maps are remarkably similar. There is little difference between students at the beginning or end of medical school, or in the 1981, 1986 and 1991 cohorts.

Discussion

Naming of the axes. The INDSCAL axes which are not arbitrary to rotation are similar in all six medical maps.

The vertical axes show 'patient contact' from Psychiatry and Paediatrics (high) to Pathology (low).

The horizontal axes can be labelled 'reductionist vs holistic'. Specialities towards the left, e.g. Surgery, are concerned mainly with solving specific problems with technical methods. Those towards the right consider the whole patient in a social or systemic context, as in Psychiatry or Public Health.

RIASEC and Medical Careers. In our general public data (figure 2) Surgery and Psychiatry differ on Holland's R-S dimension. We explored whether RIASEC maps onto medical specialities. The six highlighted specialities in figures 3 to 8 were chosen as medical exemplars of the RIASEC scheme.

Surgery - Realistic: Surgery adopts an engineering approach to medicine, using high levels of mechanical and technical skill to solve practical problems.

Hospital Medicine - Investigative: The core of Hospital Medicine (Internal Medicine) is accurate diagnosis, achieved with appropriate scientifically motivated investigations.

Psychiatry - Artistic: Psychiatry has an artistic, sometimes unconventional, approach to patients, empathetically analysing the phenomenology of symptoms within a range of interpretative psychotherapies.

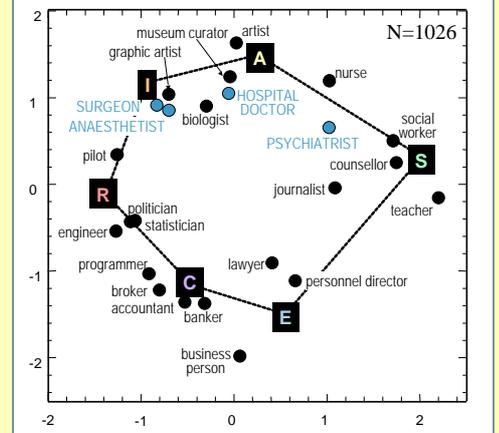
Public Health - Social: Although most medicine is concerned with individual patients, the remit of Public Health is primarily social, applying medicine to society as a whole, and treating the 'body politic'.

Administrative medicine - Enterprising: The managing of hospitals and health-care requires the creative skills of the business executive, the lawyer and the personnel director to achieve a smoothly running system.

Laboratory Medicine - Conventional: The running of efficient systems in haematology, histopathology or chemical pathology requires attributes shared with accountants and bankers, whose use of standard procedures enables the professional running of an efficient system.

While such pen portraits sometimes seem stereotypical, they often contain a core of truth. The hypothesised RIASEC categories in the medical career maps show similar properties to Holland's RIASEC system.

General Public 2002



Conclusions

- INDSCAL allows the construction of maps of medical career preferences
- The maps of medical career specialities are similar in three different cohorts and at the beginning and the end of medical training.
- INDSCAL allows a unique identification of the two axes which is not arbitrary to rotation.
- The axes can be labelled as *high vs low patient contact* and *reductionist vs holistic*.
- The map of the medical specialities shows many similarities to that of Holland's six categories.
- One can regard Surgery as Realistic, Hospital Medicine as Investigative, Psychiatry as Artistic, Public Health as Social, Administrative Medicine as Enterprising, and Laboratory Medicine as Conventional.
- These maps will be useful in studying career choice, and perhaps also in career counselling.

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Figure 3: 1991 Cohort: Applicants

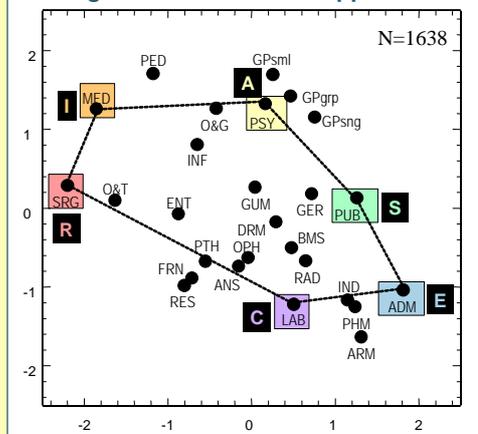


Figure 4: 1991 Cohort: Final Year

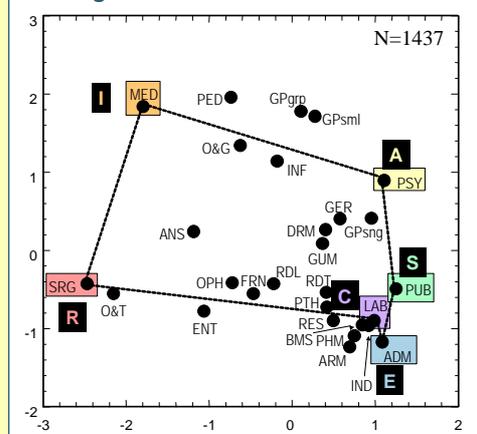


Figure 5: 1981 Cohort: Applicants

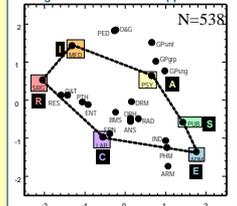


Figure 6: 1986 Cohort: Applicants

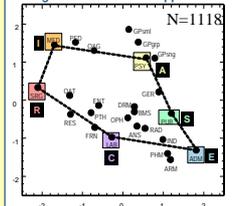


Figure 7: 1981 Cohort: Final Year

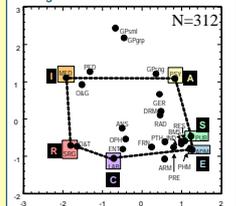
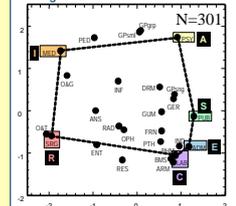


Figure 8: 1986 Cohort: Final Year



Key

- ADM Administrative Medicine
- ANS Anaesthetics
- ARM Armed Forces
- BMS Basic Medical Sciences
- DRM Dermatology
- ENT Ear, Nose & Throat
- FRN Forensic
- GER Geriatrics
- GPI r g GP Large Group practice
- GPsm GP Small practice
- GPsn GP Single handed
- GUM Genito-urinary medicine
- IND Industrial Medicine
- INF Infectious diseases
- LAB Laboratory (Pharmacology, Clinical Chemistry, etc)
- MED Internal Medicine
- O&G Obstetrics & Gynaecology
- O&T Orthopaedics & Trauma
- OPH Ophthalmology
- PEM Paediatrics
- PHM Pharmaceutical Medicine
- PSY Psychiatry
- PTH Pathology
- PUB Public Health
- RAD Radiology/ Radiotherapy
- RDL Radiology
- RDT Radiotherapy
- RES Research
- SRG Surgery