

British Psychology in 2001.

Executive Summary:

*RAE2001 has delivered an increase in volume and quality of psychological research reflecting the healthy state of the discipline overall. Growth has been achieved in part through substantial recruitment of staff from overseas – a reverse brain drain. There is high quality research in most areas of UK psychology, but there is variability in the scale of activity across different topic areas. The interdisciplinary area of cognitive neuroscience and related topic areas is flourishing, but this field will require sustained and perhaps coordinated investment in facilities. Health psychology has grown dramatically in recent years, but this may challenge the capacity to sustain good quality. Social and developmental psychology are relatively small-scale activities, ripe for growth. The requirements for trained researchers in psychology have not been matched by research training opportunities for psychology, with relatively few studentships available from OST and Charity sources. There is scope also for more imaginative dissemination of psychological research to ensure it impacts appropriately on non-academic users of research.*

British Psychology is flourishing. In 2001, the panel assessed 73 submissions totalling over 1300 staff (an increase of 15% submitted researchers against a national trend across all disciplines of 1% fewer staff submitted). In 1996, 16% of departments achieved grades of 5 or 5\* (cf. 20% across all disciplines). In 2001, 16% achieved a 5\*, and 40% of departments were graded 5 or 5\* (cf. 11% 5\*, and 39% 5 or 5\* for all disciplines combined). Psychology's relative position has improved in terms of volume and quality.

This is not surprising, since there has been a real and substantial growth in Psychology provision in UK universities fuelled in part by the sustained increase in undergraduate demand for the subject. This has led to an enormous expansion in departments offering psychology courses. But the increase in quality reflects a genuine focus on key issues at the forefront of knowledge, assisted by an influx of new staff, many of whom have been recruited from overseas. This growth has facilitated exciting developments within the discipline and at the interdisciplinary interfaces with other subjects, particularly with other neurosciences.

The panel's judgements of quality were endorsed by overseas assessors. One said: "There are quite a number of really excellent departments... There are active groups on the forefront of research in many subject areas and in many universities". And another said "Many departments seem to have undergone an enormous expansion in research since the last RAE".

While the overall picture is one of growth in volume and quality, there are some areas of the subject which are exceptionally strong, or growing extremely rapidly, while other areas show more variable development. This brief overview is organised for simplicity around those areas of psychology which were strongly represented within submissions: Human Experimental, Biological, Developmental, Social, Clinical, Health and Occupational Psychology, but attempts to capture the diversity and interplay of these different areas too.

Human Experimental Psychology

Almost all grade 5 and 5\* departments house significant research groups in one or more aspects of Cognitive Psychology (taken here to include perception as well as attention, memory, language and thinking.) A number of these researchers are world leaders in their areas. This strength has allowed UK researchers to play leading roles in related fields of enquiry. For

example, UK cognitive psychologists were pivotal in establishing the field of Cognitive Neuropsychology, the study of cognitive impairments in neurological conditions, fostering links with medical sciences. Approximately half the top-rated departments submitted significant research groups in cognitive neuropsychology, some of which include world leading individual researchers. Cognitive psychology also contributes to the newer inter-disciplinary field of Cognitive Science, the study of human and artificial cognitive systems, including the computational modelling of cognitive processes. The UK has relatively few centres specialising in cognitive science, but these are all doing high quality research. The newest and most rapidly developing field here, however, is Cognitive Neuroscience, where cognitive psychology, cognitive neuropsychology and neuroscience combine to study the neural basis of cognition. Psychological techniques and theories prove essential to reap the benefits of new developments in techniques for measuring brain activity. This is expensive and technique-led science, with significant groupings developing around the new facilities. Some such groupings have benefited from JIF-funding during the period. Whilst the latter changes have been most apparent in the 'old' Universities, significant developments in this field have taken place within some newer Universities too. The initial growth phase, as reflected in the assessment period, has resulted in the establishment of centres of excellence in about half of the departments rated 5\* and a quarter of those rated 5, typically involving collaboration with hospitals, medical schools and other departments. Cognitive neuroscience is currently spreading to more centres as brain imaging techniques become more widely available and its influence seems set to increase even more in the foreseeable future. The UK's outstanding strengths in Perception and Action (or Motor Processes) have benefited greatly from their integration into cognitive neuroscience, leading to a growth in high quality activity in these areas.

Other areas of UK psychology have benefited from its strength in cognitive psychology. An outstanding example is Cognitive Development and especially the study of developmental disorders of cognition and language, including autism, dyslexia, specific language impairment and genetic disorders. The UK is fortunate in having world authorities in all these topics. Another example is Applied Cognitive Psychology. This is a more diverse field, with good work in such important areas of application as human error and accident prevention, driver behaviour, human-computer interaction, information design, eye-witness testimony and the effects of stress. Members of the RAE User Sub-Panel (comprising professionals from various industrial and service areas where psychological knowledge is applied) stressed how much of the UK's excellent fundamental research was of value to users and had applications that were probably not known at the time of the original investigation. Users also stressed how fundamental knowledge of, for example, the visual system found ready application in a variety of settings. However, some applications areas such as road safety were mentioned as having been vulnerable to changes in policy of funding longer-term research within universities.

### Biological Psychology

Although only a minority of institutions have major commitments to biological psychology, the quality of the work is generally high. Traditional strengths in animal learning, appetitive behaviour, addiction, and experimental studies of the relationships between brain and behaviour remain well-represented within these departments. It is essential that this tradition be maintained, preferably within departments of sufficient size to have critical mass within a number of related areas. Just as strength in cognitive psychology has contributed to the development of neuropsychology, cognitive science and cognitive neuroscience within the UK, so strength in the experimental and theoretical analysis of animal learning and behaviour will continue to contribute to the development of behavioural and cognitive neuroscience. Such research requires expensive infrastructure and is increasingly interdisciplinary in character. The pharmaceutical industry relies on universities to provide people trained in these areas, and on academic research for the expertise in basic neuroscience to underpin research in drug discovery pursued in the industrial

setting. Three needs were identified by the User sub-panel: (i) basic physiological research to identify drug targets at the cellular level; (ii) research on the basic processes of brain function that change during disease; (iii) development of animal models of neuropsychiatric disease. Psychology departments contribute to all three areas and more than ten departments were recognised with research outputs of high value and international excellence. In particular, the enormous potential impact of non-invasive brain imaging for research in cognitive and clinical neuroscience was noted, offering further opportunities for interaction with industry.

#### Developmental (and Educational) Psychology

While there are strengths in areas that interact with other fields (e.g. Cognitive Development, above), the overall area of developmental and educational work is variable in strength. Fewer than 25% of high-rated departments have major groups in this area. While some relevant research may have been submitted to other panels, these areas might develop more strongly if firmly grounded within psychology, with its methodological rigour. The best research is conducted within groups of critical mass with clear leadership, engaging in strong theory driven research using a range of methodologies to address important questions about learning, development and disorders.

Interplay between developmental psychology and other areas of the discipline has resulted in some particularly creative work, and theory-driven work from this perspective was seen as a strength by the User sub-panel. There is excellent work in areas such as learning in context, developmental psycholinguistics, models of typical and atypical development, and family factors and processes – but few departments have critical mass in these areas. The move to test developmental models beyond the constraints of single disorders such as autism and considering a range of other developmental difficulties was noted positively. However, there is scope for more work on emotional development. Developmental and educational research needs to foster a larger number of strong groups UK-wide, particularly capitalising on the growth in cognition and cognitive neuroscience. Risk-taking theory-driven research will be needed. Research is required that involves more than small cross-sectional studies. Wider dissemination of psychological knowledge is also needed. As the User sub-panel commented there is scope to build on the applications of current theoretical research to develop evidence-based interventions in both educational and clinical settings. Theories of cognitive development have much to contribute to the fields of education and learning.

#### Social Psychology

The state of social psychology in the UK is best described as "mixed". Unlike almost any other country, social psychology in the UK is divided into two camps. While there is a fair representation of conventionally empirical (and often experimental) social psychology, there is also an unusually strong representation of 'critical' social psychology in which discourse analysis or conversation analysis dominate. This diversity should be enriching and distinctive, but there appears to be little communication between these two camps. If UK social psychology is to profit from its distinctive composition, the conventional and critical areas need to find effective ways of communicating and collaborating. This is important for education and training, too, so that students are not selectively introduced to one or other approach.

The quality of work is also mixed, with excellent and weak work conducted within each camp. Only a minority of top-rated departments have clear strengths in terms of critical mass within conventional social psychology, and the growing strength in the critical areas (where the UK is currently the leading international player) is mainly located among the developing universities. (However, some university departments with known strengths in social psychology were not submitted to the psychology panel for assessment.)

During the 1970s and 1980s UK social psychology occupied a leading position in Europe. The same cannot be said today, and the situation is unlikely to change unless more concerted efforts are made to develop strong social psychology groups. Development will require efforts to nurture home-grown talent for the future to add value to recent appointments which have come from overseas. Encouragement to invest in this development can be found in opportunities identified by the User sub-panel, who noted several areas of interest which would be driven largely by social psychology (e.g. leadership, group processes, crowd behaviour).

### Clinical Psychology

The RAE submissions revealed much excellence in the field of clinical psychology, both in experimental psychopathology research, and in more applied areas. Several of the stronger departments have an excellent clinical psychology research profile that allows effective bridges between theory and practice. This work is amplifying knowledge of a range of psychological disorders across the entire life-span. The field works closely, in some settings, with related work on forensic psychology, and in other settings with health psychology. There was particular evidence of strength in departments with strategic alliances and joint appointments with NHS or voluntary bodies, so that the research has both theoretical excellence and good applicability.

Much current work on assessment overlaps with the neuropsychological and cognitive neuroscience area. The best departments are able to show how excellent theoretically-driven experimental method is required to accompany and largely determine which aspects of brain function it is most useful to investigate using imaging techniques. There may be a case for Funding Councils to encourage further collaboration, perhaps on a regional basis, so that duplication is avoided as the technology develops further. Other areas require expensive longitudinal research to conduct theory-driven assessment in predicting important outcomes, e.g. reading, mathematical competence, and social/emotional development in children.

The Randomised Control Trial (RCT) remains the 'Gold Standard' for treatment outcome research. There has been a marked increase in quality of RCTs, with 'trial methodology' now a separate domain of expertise in its own right, though such trials are increasingly expensive to initiate. Research training should be modified to take account of these developments. However, few departments are exploiting alternative research designs, for example, those that are able to examine series of single cases. Such designs may be particularly appropriate in situations where individual differences in the nature of psychopathology make large group studies less relevant.

There are some areas of psychological treatment research where the UK is a clear international leader. One significant example is the psychological treatment of psychosis. There is evidence of excellent collaboration between several centres in this work. A second important area is the development of practice-based evidence to examine the effectiveness of treatment in the everyday setting of clinical service, an important complement to the 'purer' theory-driven RCT.

Rehabilitation of neurological and psychiatric disorders is surprisingly under-represented at present. Many neuroscientists suggest that rehabilitation motivates their work, but there is rather little evidence that this has made a large difference so far. Pockets of excellence do exist, e.g. in memory retraining for rehabilitation of brain damage, and evaluation of different approaches to the care of the elderly.

In clinically-related forensic work, the User sub-panel noted that there was little British research work on offending behaviour and intervention even though the quality of offending behaviour programmes in prisons and the community was recognised to be high by international standards.

### Health Psychology

The UK has the highest rates of cardiovascular disease of any developed country. Our future population will be increasingly aged, disabled and suffering from chronic conditions. Psychological inputs are essential to the understanding of factors affecting health and suitably researched psychological interventions are likely to improve outcomes in the UK, as they have already in other countries.

Perhaps in response to this challenge, the field has grown rapidly since 1996, and a total of 10% of those submitted in 2001 were health psychology researchers, though their concentration is greater in the developing than in the high-rated research departments. This may reflect difference in mission – some newer universities emphasise applications-driven, community-relevant research – but it was also noted that some departments with stronger research portfolios have found it difficult to recruit Health Psychologists with strong research track records. Some developing departments have recruited relatively junior researchers who may find it difficult to sustain a successful research profile in departments with limited research support and high commitments to teaching. The net result of this is that a great deal of training of the next generation in Health Psychology will be done by less experienced researchers in universities without strong research cultures. This is unlikely to strengthen the field in the long term. A further concern was that much Health Psychology research submitted used weak methods e.g. using observational, cross-sectional studies to investigate questions with a causal element. The User sub-panel stressed that weak research methods are not of value to them.

Much of the best research in health psychology in the UK lies at the social end of health psychology and the UK has a strong international reputation for such research. The RAE2001 submissions showed an increase in the proportion of social health psychology papers published in the best journals.

Other areas of health psychology will require substantial research funding to achieve the superior longitudinal and experimental [RCT] designs necessary. The UK is also successful in publishing in the best interdisciplinary journals appropriate to this, behavioural medicine, domain. Such research is more commonly conducted in medical or related departments and some of the best research in Health Psychology will have been submitted to medical UoAs. While this suggests a better balance of quality overall than is suggested from UoA13, it does mean that these researchers may not be available to train future researchers in Health Psychology as the subject expands within psychology departments.

The UK also has an urgent need to reduce the costs of healthcare (especially the costs of staff involved in healthcare delivery). Improved research on the behaviours involved in delivering healthcare is urgently required. The User sub-panel noted that even where there is evidence of which modes of healthcare delivery are likely to be most effective, this research is not necessarily implemented in practice, and it is important for psychology to be contributing to the implementation research agenda.

### Occupational Psychology

There was a reasonable volume of good occupational work throughout the submissions, with several departments delivering consistently at the upper end of the national/lower international level of excellence. In total just over 5% of researchers were active in the area of occupational psychology, in addition to work in human-computer interaction and ergonomics. Some of this occupational research is of consistently good quality and is highly valued by users: for example, work on organisational safety climates in high risk industries is recognised as growing in size and at the leading edge of applied psychology internationally. Research on workplace stress is of

importance too. Perhaps surprisingly, though, considering many other pressing contemporary occupational issues that psychology could address (such as the impacts on people of changing work and career patterns), the panel saw very few departments where occupational research is represented by a critical mass of co-ordinated academic activity. This may be because some established groups chose to submit their research to the Business and Management panel.

#### Further observations from Users

Overall, the User sub-panel reported that the breadth and the quality of work across the sector was impressive in the areas of psychology reviewed, knowing that much work relevant to their interests would have been submitted to other panels. They noted that Users of psychology research are looking for work of academic excellence with sound theoretical underpinning, and that they value long-term research rather than short-term applied work which can be done by consultants. However, academics do not always promote work of potential User value. This may reflect uncertainty about the most appropriate avenues for communication or lack of training in how to develop a dialogue with Users. It would be possible to address this training issue through the transferable skill components of post-graduate training. There may also be an opportunity to develop an appropriate journal to facilitate transfer of knowledge from the academic to the applied arena. This raises broader questions about how fundamental research is disseminated. Current electronic indexing systems have been designed with academics in mind and there might be value in building interfaces for different user groups.

Users also noted areas where they would like to see more work. These included:

- behavioural performance in context;
- safety within nuclear, aviation and military applications;
- group and crowd behaviour;
- workforce issues (recruitment, training, teamwork, leadership, organisational change);
- increasing implementation of research findings in health care.

In such areas collaboration between psychologists and other researchers is required, for example, with education, management, sociology, computing, medicine and ergonomics.

#### Research training

Total numbers of research students in departments at the census date varied from 0 to around 60, with a mean of 1.3 research students per member of research-active academic staff in the top-rated (5 and 5\*) departments. The top departments on average delivered 1.4 PhDs per member of staff across the five years of the review. Psychology PhD studentships are funded from various sources. On average across all departments a total of only 6 over 5 years come from OST sources, and less than 1 from the private sector. The single largest source is from institutions themselves, with departments funding an average of 12 institutional-funded studentships across the five years. OST and charity-funded studentships are held predominantly within higher-rated departments. There are substantially fewer OST and charity studentships for psychology in comparison with other biological and medical sciences. For example, *seven times* as many OST and charity studentships were funded in the Biological Sciences compared with Psychology (the total numbers of researchers submitted in Biological Sciences was not quite twice that in Psychology). The shortage of externally funded studentships in psychology makes it extremely difficult for the next generation of researchers to be trained – the onus is falling disproportionately on HE Funding Council or research overheads income, via institutional studentships, drawing resource away from other research infrastructure needs for the discipline.

To a certain extent, the recruitment of staff from overseas has also reflected a lack of research-student training within the UK, perhaps most serious in parts of the discipline where there have been rapid advances. Whilst institution-based funding of studentships has helped to rectify this, there has at the same time been a reduction in OST research council-funding of research-related masters courses. There remains a continuing need to develop skilled researchers in the field.

### Research Funding

The total external research funding won in the 5 years reviewed averaged over £100,000 per member of research-active staff, with about 70% of this total coming from OST and charity sources and about 25% from Central Government and Industry. There was relatively little EU or overseas funding. Psychological research is supported by project and programme grants from research councils with important funding from the MRC, where the co-operative group framework has helped to fund research for infra-structure (image analysis facilities, neuropsychological screening etc.), and from ESRC, EPSRC and BBSRC where the support is almost entirely in discrete projects. Only Wellcome and MRC regularly fund programmes of research for psychologists. Amounts of funding in psychology are very low compared with other biological and medical sciences. This may in part reflect the diversity of psychological research, not all of which requires expensive equipment and facilities. However, the spread across different research councils may mean that psychological research of importance is falling at the boundaries between different research council interests.

Different funding bodies have differing roles to play in the opportunities identified for further growth within the discipline. It will fall on the ESRC to help shape growth in social psychology, and interfaces here with health and occupational issues may provide particularly timely opportunities for development. BBSRC, MRC and Wellcome might usefully examine whether their research training and career development funding policies are favourable for disciplines such as psychology which straddle many funding agencies. The Funding Councils and Research Councils together might explore opportunities for further investment in 'expensive' facilities such as those needed for cognitive and behavioural neuroscience in regions currently unable to access these, and such coordination might help avoid unnecessary duplication too.

### Further Infrastructure issues

Successful departments provided clear evidence of planning their developments in a realistic and coherent way, building on their strengths, facilities and staff skills. Strong departments were characterised by sufficient staff to form a critical mass in distinct areas of psychology. Clear research leadership was evident, complemented by the development of a postgraduate and in some cases postdoctoral community. Research areas were often developed in a flexible and collaborative manner. Strong research departments contained a balance of research involving both the consolidation of research agendas and the development of innovative approaches and projects. Sometimes this involved complementary areas within the discipline, or with other disciplines or users of research. Strength was also gained by securing research funds from a variety of sources, with university funding resources used to bridge or provide important start-up funds. Three issues arise from these observations:

- Key areas within the discipline suffer from insufficient numbers within many departments to provide a critical mass. Health, developmental and social psychology are particular examples. Productive research involves collaborative effort involving several researchers, and collective efforts spread the load for research training and developing junior staff.
- Developments across the discipline raise infrastructural issues to ensure the supply of suitably trained junior researchers and to provide access to sufficient funds to develop areas, and to fund expensive specialised equipment or trials.

- Developments within the discipline require enhanced mechanisms for knowledge transfer, to ensure high quality psychological research impacts appropriately upon adjacent disciplines, and upon non-academic users of research.