

Institution: University of Aberdeen

Unit of Assessment: 4 - Psychology, Psychiatry and Neuroscience

a. Overview

Psychological research at the University of Aberdeen is focussed primarily in the School of Psychology, and this submission comprises only academics within that school. The School is part of the College of Life Sciences and Medicine, one of three colleges at the University, comprising Medicine and Dentistry, Medical Sciences, Biological Sciences, the Rowett Institute of Nutrition and Health, and Psychology. This administrative structure supports a wide range of inter-disciplinary research within the medical and life sciences, as described below. A College Graduate School also oversees all postgraduates, providing discipline-specific and cross-college support and training.

The School of Psychology has seen significant staff turnover in the assessment period, with **thirteen** new staff appointed since 2008. This represents a very high proportion of submitted staff (over 60%) and reflects the School's focus on further improving its research-base.

Early in the assessment period, a decision was taken to build a new group in Perception and Attention (see below). This has been achieved through recruitment of internationally competitive researchers, and the group is now very strong. The School's traditional strengths in Cognition, and in Social Cognition have also been supported through new appointments. By focussing on these three core areas of psychology, the School has been able to consolidate apparently diverse research, and to bring together researchers who previously operated in separate groupings. One specific aim was to integrate theoretical and applied psychology into more coherent theme-based research (an ambition set out in the submission to RAE2008).

b. Research strategy

The School of Psychology is a dynamic research-led organisation. The School supports high quality research, and provides an environment in which active and ambitious researchers can flourish. Research is currently organised into the following groupings.

1. Perception and Attention

This group represents the largest development in the period, in terms of new staffing, research infrastructure, and grants awarded. Staff appointed in the period are Drs **Andersen**, **Chakravarthi**, **Hermens**, **Hesse**, **Hunt**, **Martinovic** and **Pilz**. These staff join the group's existing members Prof **Sahraie** and Dr **Neri**. This development, reflecting a significant new investment in staff and facilities, represents a commitment to Psychology by the University of Aberdeen, and forms a major part of the School's future strategy.

The activity of the group is wide-ranging, including research on perception (visual and haptic, high and low level), attention and the control of action (including eye movements). Significant and well-cited articles have appeared in the period on each of these topics (see REF2). There is a cohesive structure based around a within-group seminar series, and methods-based training workshops led by individual group members, and by visiting researchers. Group members using techniques based on neuroimaging, behavioural studies, group and single-case patient data, meet regularly to exchange results and forge collaborations. This intra-group collaboration has resulted in the development of current bids for large-scale funding (collaborative grants are currently under review).

The group has also made significant contributions to clinical assessment and remediation in vision. Work led by **Sahraie** has resulted in a number of patents, and a spin-out company, as described in the Impact Case Study 'Physiotherapy for the eyes'.

2. Cognition

This is a group with a broad range of interests, which has been consolidated in the period by the appointment of Prof **Burton**, who joins an existing strong grouping comprising Profs **Phillips** and **Crawford**, and Drs **Bull**, **Cleland** and **Swainson**. A strength of the School, particularly evident in this group, is an emphasis on lifespan development, and the work of Phillips and Bull has produced significant output in the period – often with professional groups from education and clinical collaborators in the UK and abroad.

REF2 outputs from the group emphasise theoretical and methodological developments, and particularly influential articles have appeared on face recognition (**Burton**), psycholinguistics (**Cleland**) and quantitative methods (**Crawford**) in the period. Furthermore, Crawford's work has led to a significant change to assessment practices in clinical psychology and clinical neuropsychology. That work is described in the Impact Case Study 'Assessment of Mood and Cognitive Function', and continues to the present.

The operation of this relatively diverse group is brought together by regular within-group research meetings, also attended by research staff and research students. All members of the group have theoretical and applications-based interests, and there is strong mutual support in developing these links. The group also has strong collaborative links with other members of the University, for example in Medicine (**Crawford** and **Phillips**), Computing Science (**Cleland** and **Burton**) and Education (**Bull**).

3. Social Cognition

This group represents a long-standing area of excellence in Aberdeen, and one to which we remain committed. New appointments in the period have been made to support this research theme: Drs **Jackson**, **Lumsden**, **Miles**, **Ray** and **Timmermans**. These staff join an existing group led by Prof **Macrae**. Using a range of methodologies (e.g., behavioural, brain imaging), research in this group explores issues in person perception, interpersonal coordination, stereotyping, emotional processing, metacognition and the assessment of risk.

The Social Cognition group continues to make a strong contribution to the literature, and outputs listed in REF2 are making significant impacts on the field. These include influential articles on social neuroscience (**Macrae**), personal understanding (**Timmermans**) and mental time travel (**Miles**).

Research in real-world perceptions of risk, and psychological aspects of safety continue to be a highlight of the group's activities. For example, work with surgeons, with the oil industry, and with air traffic control has led to significant contributions to each of these workplaces during the period. Some of this work is described in the Impact Case Study 'Making Surgery Safer', and the integration of these activities with the theoretical contribution of the group can be found in the Impact Template document (REF3a).

Research Culture

The primary aim of the School's research strategy is to provide a well-equipped and supportive environment which nurtures the activities of committed researchers. Having established the three-group structure described above, the main ambition of the School is to enable staff to develop their research optimally. The recruitment of a large number of new staff (the majority of this submission) has emphasised appointment of ambitious and talented academics, who are highly motivated to conduct excellent research.

The School Director of Research (always a senior staff member) supports research activity within the School through strategic allocation of local research funds, in association with the School's well-funded research committee. He or she also interviews all staff annually to discuss their research. At these meetings, individuals can set their own goals and targets for the coming year, and can discuss any support that would help these to be achieved. This is a productive system, and staff find it a useful way of reflecting on their ambitions and achievements.

The College and University also provide training and support for staff at all levels. Funds for research support are available from university-level research schemes (e.g. Principal's Excellence Fund, Principal's Interdisciplinary Fund). Regular workshops are held on how to be a productive PI, how to manage research staff, and how to publish effectively. The University is committed to wide dissemination of scientific research, and operates a highly popular and successful series of 'Café Scientifique' talks to the general public (held not only in Aberdeen, but also in smaller towns in the region). Psychology staff members contribute talks to this series. In 2012 the University hosted the British Science Festival. Once again, psychology staff, researchers and postgraduates gave talks and mounted demonstrations for this major dissemination event.

c. People

i. Staffing strategy and staff development

All recently-appointed staff have been selected on the basis of excellence in research, as well as in teaching. Of the new staff appointed in the period, one is a professor, eleven are lecturers, and one a RCUK Fellow (subsequently appointed lecturer). This demographic range reflects the needs of the School, and has resulted in a dynamic atmosphere, in which young researchers play a very active role. There has also been loss of staff through retirement, and through staff leaving to take up promoted positions in other universities. While we have been sorry to lose colleagues in this way, all have been replaced by excellent research-focused appointees from other institutions.

On appointment, new staff are required to prepare a three-year plan, and this is reviewed annually at a meeting with the Head of School. Research is also a key part of the annual appraisal scheme for all members of staff. New staff are all allocated mentors from among senior colleagues on arrival. The mentoring system provides further support for career development across all academic activities. New staff are given a small teaching and administration load in their first years, ramping up to a full load in year 3, in order to allow them to establish their research. All new staff appointed have dedicated (single-occupancy) laboratory space, provided by the School on arrival. Furthermore, new staff are favoured in resource allocation by the research committee, particularly with a view to conducting pilot studies prior to applications for external research funds.

Strategically, the School has aimed particularly to expand its activities in Perception and Attention. The appointment of seven new staff in this area reflects a commitment to this field. Excellent facilities for research, coupled with a critical mass of permanent staff (and associated research staff), make this an exciting development in the period. Alongside these developments, we maintain good established groups in cognition, and in social cognition. Of course, there are many collaborations between groups, and new appointments often span groups. This structure means that staff previously allocated explicitly to an applied psychology grouping have been integrated into broader group structures. This reflects a commitment more closely to couple theoretical and applicable research.

The School operates within the Researcher Development Agenda, ensuring that policies and procedures reflect the principles of the Concordat (UUK/RCUK). All researchers were issued with a copy of the Concordat by the Vice Principal for Research in 2009, and the responsibilities of researchers and institution are made clear. (For more recent appointments, this pack forms part of staff induction.) The University Researcher Development Unit (<http://www.abdn.ac.uk/develop>) offers a range of development opportunities, including many workshops and courses with an emphasis on support for Early Career Researchers. The induction programme is attended by all new researchers, and is followed-up by longer term support at both university level (through CPD) and through local provision (through a well-resourced mentoring scheme).

Consistent with its research environment, the School houses a substantial number of research staff. All research staff are encouraged to take part in the School's research activities, i.e. regular seminars (internal group-based seminars, as well as department-wide visiting speaker seminars). They are also eligible to apply for conference support from the School research committee, and are

supported in applying for external funding by regular workshops given by staff on research administration. Research staff play an active role in shaping the School's research support strategies, and have membership on all relevant committees.

A new College-wide scheme was introduced in 2012 to support early career researchers to compete for fellowships, particularly those aimed to develop researchers as independent scientists. All research staff applying for these fellowships attend a training workshop, and are assigned a mentor to support the application. As part of the application process, researchers must attend an interview conducted by senior staff, at which the details of the application are discussed. The aim is to give ECRs maximum support, and to ensure that only the highest quality applications are submitted.

The School also has nine full-time teaching staff, appointed on University Teaching Fellow scales. These range from junior teaching assistants to SL level. These positions, which are not themselves intended for research-active staff, nevertheless greatly support the School's research by freeing members of staff from some of their more routine teaching. Furthermore, these staff all have some research interests, and are regular contributors to seminar groups and research events throughout the School.

The University is fully committed to equality for all staff and students, and received bronze membership of the Athena SWAN Charter in 2011. The University has achieved Investors in People (IiP) status across the institution, recognising and valuing the contribution of employees in accordance with IiP Standards. The University Court has overall responsibility for the Equality and Diversity Policy. The University applies this policy to all aspects of employment within the School, including recruitment, promotion, development opportunities and disciplinary procedures. All staff have access to Equality and Diversity training providing fundamental education in the legislative framework and its practical implementation. This training is mandatory for all staff with supervisory and recruitment responsibilities.

ii. Research students

The School has a healthy population of postgraduate research students. We are a member of the Scottish Consortium Doctoral Training Centre, an ESRC-recognised DTC, and have received studentships each year through this route since the scheme was founded in 2011. Other research council studentships are funded by BBSRC and the ERC. The School has also trained students funded by industry (e.g. Shell, Eurocontrol, the Energy Institute) and charities (e.g. NHS Endowment Trust, Carnegie, MS Society). In 2013 the School houses 25 full time research students, and a further 4 full time Masters students, on an ESRC-recognised MRes. In addition to their formal training, this provides a critical mass for peer-support within the research student body.

The School aims to produce students with broad transferable skills across the range of psychology, as well as specialist knowledge in techniques appropriate to their research area. To achieve this, all research students have access to dedicated research space and facilities, mainly through their supervisor's research group, but also more generally through research training offered by staff (for example ERP methods, **Martinovic**; Matlab, **Hunt**; movement dynamics, **Miles**). The School is a recognised outlet for ESRC 1+3 training, and students coming through this route take an MRes in Research Methods prior to commencing their PhD. Importantly, all other research students are required to take components of this course, leading to a Postgraduate Diploma in Research in the first year of their graduate training.

Students are all allocated second supervisors, and in some cases industrial or clinical supervisors too. Progress is monitored closely, with formal assessments taking place at the end of month 9, and annually thereafter. The student's advisory committee will discuss the research project and advise on whether the student might benefit from additional training in any general or subject-specific area. All students present their work annually at a School research meeting. They actively participate in (and in part organise) the group-led seminars, and attendance at departmental seminars is compulsory. Funding is provided to attend, and present to, national and international

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conferences. Students have full access to computing and technical support, and all postgraduates are encouraged to perform a small amount of tutorial teaching or project supervision for which they receive prior training from both the College and the School.

The School also provides strong support for undergraduate research. In the summers of 2008-2013, a total of 30 scholarships were awarded to undergraduates entering their final year, in order to carry out research during the summer vacation. These were funded by Nuffield, Wellcome, the Alzheimer's Trust, the Experimental Psychology Society, and local benefactors. This research is always closely supervised within one of the research groups, and adds to the general research environment.

d. Income, infrastructure and facilities

The organisation of research into three groups allows strategic allocation of facilities and resources. Although inter-group collaboration is encouraged (and common), allocations of school funds are made within this structure to support standard facilities. On-site research infrastructure is excellent, and includes the following facilities. The School houses three multi-channel EEG/ERP laboratories (1x128 channel, 2x64 channel) equipped for vision and attention research. There are three EyeLink-1000 eye-trackers, supporting research in vision, psycholinguistics and social cognition. In addition a recently-purchased mobile eye tracking system (SMI Glasses with iView/BeGaze software) supports visual research in natural environments in healthy adults and clinical populations. There are two state-of-the-art motion tracking systems (an Optotrack 3020, and a Polhemus Liberty 6df magnetic system). Instrumentation for physiological measurements includes two Portable Biometrics capture devices (for multi-participant EMG and kinematic recordings) and a Biopac telemetric system for basic response (HR, BP, GSR etc). There are many well-found psychophysics laboratories equipped with high resolution (spatial and temporal) displays, highly controllable ambient lighting, and sets of sophisticated display goggles (e.g. Milgram Shutter glasses for suppression of visual information in motion, and CRS FE-1 Stereovision goggles which can be used during EEG capture). Use of these common facilities crosses groups. For example, motion capture is used by both Social Cognition and Perception & Attention groups. Similarly, eye-tracking is used across the School. School-level funding supports this infrastructure, and we particularly encourage collaboration across traditionally separate sub-disciplines. All these facilities are available for research students as well as permanent and research staff.

In addition to in-house research facilities, the School makes extensive use of the University imaging facilities. Aberdeen is one of the six Scottish universities that participate in SINAPSE (Scottish Imaging Network). Established with funding from the Scottish Funding Council, this research pooling consortium provides a strong, dynamic network and a shared environment for strategic research development in brain imaging. The University of Aberdeen has state of the art imaging facilities that are centred around a Philips Achieva X-series 3T MRI scanner installed in the Aberdeen Biomedical Imaging Centre (ABIC). Staff making use of these facilities are **Crawford, Macrae, Phillips** and **Pilz**, the first three of whom have published several papers with ABIC staff, while **Pilz** is a recent recruit whose current BBSRC project (see below) makes use of these fMRI facilities. There is also a close collaboration between the School and the University's researchers in geriatric medicine. The well-known Aberdeen Birth Cohort (ABC) consists of about 350 men and women born in 1936 who have been tested regularly on cognitive and health factors. **Phillips** sits on the Steering Group for ABC, and has led much research on this cohort, as well as the related Lothian Birth Cohorts, based in Edinburgh.

External research funding reflects the demographic shift in the School in recent years. We have been particularly successful in attracting funding aimed at early career researchers in the period. For example, **Hunt, Martinovic** and **Pilz** each received BBSRC early-career grants (£158k, £186k & £221k, starting in years 2010, 2011 & 2013 respectively), while **Neri** won an MRC New Investigator award (£580k, 2011). These researchers have also been successful with other funding: **Hunt** won the James S. McDonnell Scholar Award in 2012 (US\$600k), and **Neri** won a

Royal Society University Research Fellowship (£400k, 2011-2014, an extension of an earlier award). The School won two major European Research Council *Starting Grants* in the period, to Drs Turk & Jones (£610k and £1.15M respectively; both staff have subsequently moved institutions). Further EU funding was awarded to **Burton** (€1.5M, sole applicant of an ERC Advanced Grant, start date June 2013). Other notable grants in the period include funding from ESRC to Drs Martin & De Bruine (£162k & £170k; De Bruine has subsequently moved institutions). **Burton** was awarded an ESRC Professorial Fellowship (£460k, 2012) and **Crawford** won an NHS Quality Improvement Award with colleagues in the Medical School (£72k) and an MRC award with colleagues at the Open University (£470k). **Phillips** was part of a consortium awarded an ESRC/BBSRC/MRC network grant (£200k). In addition to Research Council funding, the School also has a healthy income from government and industrial sources. Notable grants include an award from NIH to **Bull** (£375k), from Unilever to **Burton** (£120k) and from Shell to Flin (£98k), as well as awards from Eurocontrol (Air Traffic) to Mearns (£349k in total). Several of these grants were awarded very recently, and will not yet be evident in records of *spend* for REF2014. However, the awards mark a sharply increasing trajectory in research *income*, consistent with the appointment strategy in the period.

In addition to external funding, the School has recently benefitted from a major theme-based investment within the University. There are four University research themes which aim to promote multidisciplinary research across Schools and Colleges, through pump priming for pilot projects, workshops and jointly supervised PhD studentships. One of these themes is 'Pathways to a Healthy Life', aiming to enhance the University's contribution to all aspects of healthy ageing and well-being. **Phillips** is a member of the theme's management team, and plays a key role in supervising the psychological contribution to its funded projects.

Research governance is integrated across institutional and School levels. The University operates a Framework for Research Governance, which implements all institutional policies and guidelines, ensuring that research conforms to the highest standards. At College level, there is a College Ethics Review Board which oversees all ethical aspects of research on human and animal participants. Operation of this Board includes monitoring and (required) training workshops for all staff engaged in research. The College also operates a peer review system for all funding applications. This formalises best-practice by requiring that *all* applications for research funding are reviewed by at least two staff members. Further procedures are in place for supporting research applications by early career researchers and applicants for fellowships (see Staffing Strategy).

e. Collaboration or contribution to the discipline or research base

As described above, the demography of the School has changed significantly in recent years, with an emphasis on early career appointments. While this has significantly enhanced the research environment, it means that wider disciplinary contributions tend to be concentrated on the smaller number of well-established staff.

Eight members of staff currently sit on journal editorial boards: **Burton** (*Perception*, Editor of *Quarterly Journal of Experimental Psychology* until 2009); **Crawford** (Associate Editor for *Journal of Neuropsychology*, *Cognitive Neuropsychology*, *Brit J Clin Psychology*, *Cortex*; Consulting Editor for *Psychological Assessment*); **Hermens** (*Behavior Research Methods*); **Hunt** (*Journal of Experimental Psychology: HPP*, *Frontiers in Perception*); **Macrae** (*Journal of Experimental Social Psychology*, *Social Cognition*, *Personality and Social Psychology Review*, *British Journal of Psychology*; *Journal of Personality and Social Psychology* until 2011; Associate Editor of *Psychological Science* until 2012); **Miles** (*Frontiers in Psychology*); **Neri** (*Frontiers in Perception Science*, *ISRN Biomathematics*); **Phillips** (*Journal of Gerontology*, *European Journal of Cognitive Psychology* until 2009). In addition, **all submitted staff** (including all recently-appointed staff) contribute to the peer-review process by acting as referees for journals and grant bodies (space precludes an exhaustive list).

Staff make many further contributions to the national and international research infrastructure

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within the discipline. The following examples illustrate this. **Burton** was a member of the European Science Foundation grant panel (2009, 2010), and is a member of both ESRC and EPSRC review colleges (since 2010 and 2006, respectively). He wrote two consultancy reports for ESRC in 2008 (on evaluation of innovation and on the strategic plan). He was also commissioned by ESRC to write the overview of Cognitive Psychology for the International Benchmarking Exercise, held in 2011. **Cleland** was a member of the ESRC first grants commissioning panel (2009, 2010). **Hunt** and **Martinovic** organised the annual Scottish Vision Group Meeting in 2012, and **Andersen** was joint organiser of the German Psychophysiology Conference, 2009. **Martinovic** and **Phillips** are members of the ESRC review college. **Swainson** was a committee member of the British Neuropsychological Society, 2006-2009.

The School's contribution to international conferences is strong, and staff have given a number of keynote addresses in the period. Notable examples include **Burton** (TeaP: *Tagung experimentell arbeitender Psychologen*, Jena, 2009); **Crawford** (International Neuropsychological Society, Oslo 2012; Australian Society for the Study of Brain Impairment, 2013); **Macrae** (European Social Cognition Network, Gothenburg, 2010; Annual conference of the British Psychological Society, Glasgow, 2011). Many staff have given invited talks in international symposia (space precludes an exhaustive list), and some have attracted prizes for papers or posters (**Jackson**, British Association for Neuroscience, 2008; **Timmermans**, German Cognitive Science Society, 2012; **Hunt** and postgraduate student Clara Hungr, European Conference on Visual Perception, Toulouse, 2011).

Several of our staff have been recognised by the confirmation of awards and fellowships. **Burton** is a Fellow of the Royal Society of Edinburgh (FRSE), and won the Experimental Psychology Society Mid-Career Award in 2012. **Neri** won the Applied Vision Association David Marr Medal in 2012 (awarded only once every two years to an outstanding vision scientist at an early career stage). **Hunt** was recipient of the highly prestigious James S. McDonnell Scholar Award, 2012-2016 (see above). **Macrae** was elected FRSE in 2008, and Fellow of the British Academy in 2011. He held a Royal Society-Wolfson Merit Award from 2006 to 2010, and in 2008 won the Kurt Lewin Medal, a mid-career award for outstanding scientific contributions to social psychology (European Association of Social Psychology).

In summary, the School of Psychology has followed through its commitment to developing a highly active research environment, in part through appointment of new staff. As well as changing the demographic profile of the School, this has opened up the opportunity for many new collaborations, some based on the contacts of these colleagues. We will not list collaborations individually, but say that there are active projects underway with researchers in Europe, North America, Asia and Australia. All these collaborations have resulted in high quality publications (see REF2), and will form the basis of future intellectual developments and funding bids. The management of the School, led by the established academic staff, is committed to supporting high quality research across all its staff, as demonstrated in this submission.