Institution: University of Aberdeen

Unit of Assessment: 4 - Psychology, Psychiatry and Neuroscience

a. Context

The impact of our research is central to the strategic priorities of the School of Psychology. Our current portfolio encompasses basic, theoretical science through to problem-driven commissioned investigations from government, healthcare and industry. Research in the School has, for over a century, demonstrated a range of applications and influence on practice, most notably in clinical, industrial and forensic settings.

i) Clinical and Health Research has been a long standing area of strength within the School. Psychological assessment (led by **Crawford**) is an important component of our work, and many tools for clinical use have been developed and delivered to the community. More generally, the School has expertise across a number of psychometric fields, and significant instruments have been developed in the measurement of psychological ageing (led by **Philips**). Notable health-specific grant funding in the period includes £72k, (NHS); £470k (MRC) (**Crawford**) and £375k (NIH) (**Bull**). The School actively fosters translational aspects of its research. Innovative studies by **Sahraie** on the human visual system have provided direct benefits for visually impaired stroke patients using his new product for vision therapies. **Benson's** work on saccadic eye movements in the diagnosis of schizophrenia has resulted in a new diagnostic test (Converge Challenge 2013 award for most promising new business). There is strong co-ordination between industrial and clinical projects; research in risk has been applied to patient safety in the NHS and other healthcare systems. Concern relating to adverse events for patients (10% UK hospital admissions) has stimulated psychological research (led by **Flin**, £1.5M Scottish Funding Council) into the risk implications of clinicians' behaviours in the operating theatre and intensive care unit, and the consequent development of behavioural rating tools with educational and training packages. Mechanisms for dissemination to professional bodies and influence on policy have been principally through Medical Royal Colleges via their Educational and Professional Standards departments, plus advisor roles /membership of task groups (Department of Health (England; Scotland)).

ii) Industrial Research within the School focuses on risk and human behaviour in safety-critical work environments. The *Industrial Psychology Research Centre* (www.abdn.ac.uk/iprc) has engaged with the oil and gas industry in Aberdeen since 1996, as well as nuclear power, aviation and healthcare. Led by **Flin**, the Centre has produced measurement tools (e.g. for safety climate or non-technical skills), publications and training packages. Commissioned research and consultancy has enabled advice to industry (e.g. Energy Institute, Oil and Gas Producers), and to Government (Health and Safety Executive (HSE), Civil Aviation Authority, EASA, MOD). For example, grants from Shell, Maersk, Energy Institute, NASA and Eurocontrol (Air Traffic) (total £640k) were awarded in the REF period. While risk forms the major activity of the Centre, there is also engagement with industrial partners on other areas of expertise. For example, **Burton** was awarded a grant (£120k) from Unilever to carry out research on product packaging.

iii) Forensic Research focuses on applied aspects of face recognition – a long-standing strength of the School. The Aberdeen work on eye witness testimony (Ellis, Shepherd & Davies) remains influential in police procedures thirty years later. This research continues, particularly in work by **Memon** (1999-2010) and **Burton** (appointed 2011). **Memon's** work on child witnesses (funded by ESRC while in Aberdeen) was influential in new legislation; cited in the Vulnerable Witnesses (Scotland) Act 2004 (Guidance Pack, Scottish Executive). **Burton's** applied work in Aberdeen has focussed on police and security personnel, particularly those required to verify identity from photographs. His current fellowship from ESRC (£480k, 2012) and his recently-awarded advanced grant from the EU (€1.5M, 2013) both include support for research with police and passport officers. Although we have not included a case study in this area (because the timings fit other cases better for REF2014), forensic face recognition research remains an active and important part of the School's activity, and one with significant impact.

b. Approach to impact

1. Translating scientific achievements into practice. The Unit's approach to achieving impact is founded on the promotion of high quality scientific research in basic and applied psychology and enabling dissemination and translation to a wide range of potential users. Theoretical and problem-driven investigations co-exist in the School's three research groupings, encompassing clinical, forensic, health and industrial psychological applications. International collaborations with centres of academic excellence have been complemented by relationships with users of research output. Joint project working with practising clinicians (**Benson** - body image, schizophrenia, **Phillips** - emotional and social problems in multiple sclerosis, stroke and dementia, **Cleland's** studies with stroke patients, **Sahraie** - stroke and ophthalmology) is well established, along with studies involving industrial professionals (**Flin** - safety; **Burton** - facial identification/ security systems). Multidisciplinary research is typical, with collaborations from the NHS (anaesthesia, surgery, clinical governance), specialist patient groups, (NHS Grampian birth cohort, stroke clinic, gerontology, psychiatry), charities (Alzheimer Scotland, Benjamin Trust), medical colleges, and the aviation, energy and security industries.

2. Communications and public engagement in the Unit's research

The University's Communications Team is an effective link between Psychology researchers and the international media. A member of staff in Psychology advises on research publicity and also identifies researchers for expert comment. Researchers attend media training provided by the University Press Office. Recent examples of psychological research featured in the media include: **Miles, Martin** - social cognition, **Jackson** - emotion, **Martinovic**, **Chakravarthi, Sahraie** - vision research, **Benson** - eye movement tests for schizophrenia, **Flin** - safety in the oil industry.
(i) *University Public Research Profile web site (Public Research Profile):* - details our research publications and communication of research, links to newspapers, radio, television, social media.
(ii) *School of Psychology* w*ebsites*: research groups have their own websites for promoting public engagement with science. For example, the Industrial Psychology Research Centre website provides access to measurement tools and research-based guidance documents which are widely used in healthcare and industry, (www.abdn.ac.uk/iprc) and researchers regularly answer enquiries from users on tool applications (especially for other cultures), interpretation and training methods.
(iii) *Public Engagement with Science Team (Public Engagement with Science Unit)*: - works closely with psychologists to disseminate research findings at public events e.g. **Macrae** at the Royal Society, **Philips** for the Aberdeen Birth Cohort, Grampian 50+ Festival, Alzheimer Research; **Sahraie** at Café Scientifique. The 2012 British Science Festival (Aberdeen) featured psychologists presenting lectures and demonstrations on their research, e.g. **Martinovic** and **Hunt's** BBSRC studies on vision, plus **Martin** and **Chakravarthi**. **Martinovic** and **Martin** are STEM ambassadors.
(iv) *Industry Lectures* An energy company, *Plexus Systems,* sponsors an annual industrial psychology lecture showcasing research findings to an audience from healthcare and industries. Masterclass events where Aberdeen psychologists including **Flin**, explain their non-technical skills tools have been organised by the: Royal College of Surgeons Edinburgh, Royal Society of Medicine, Royal Australasian College of Surgeons. Research presentations at industry sites and conferences are an essential part of the dissemination strategy (Society of Petroleum Engineers; Eurocontrol senior managers' forum; EDF nuclear power plant; Royal Aeronautical Society).

3. Identification, Interaction and collaboration with other key stakeholders and policymakers

Key stakeholders are identified by principal investigators and psychology researchers are supported to engage with them, such as via participation in boards, and committees to present their research and its products. **Flin** is on the Safety Advisory Committee of the Military Aviation Authority (MOD), the Royal College of Surgeons Edinburgh, Patient Safety Board, and NHS England/Department of Health clinical human factors advisory groups. **Burton** advises the Criminal Cases Review Commission (and Scottish counterpart) on identification based security systems, and has recently written several case-based reports to these bodies.

4.Commercialisation, business and research support and knowledge transfer

The School receives support from the University Research & Innovation (R&I) unit. Its experts work with psychologists to take excellence in research into commercial application and knowledge transfer, protection of intellectual property, licensing, patent application and spin-out companies (The University was ranked 6th by PraxisUnico in the UK for 2010-12). R&I facilitates business

access to University researchers, services, technologies, and offering consultancy, professional development and commercialisation. It has worked with **Sahraie's** group in all aspects of commercialisation of its research with stroke patients leading to a spin out company (*Sight Science Ltd*); one patent granted and one pending based on intellectual properties generated by this group. **Benson's** work has been supported in the formation of a spin-out company *Saccade Diagnostics* (patent pending). Staff undertake consultancy projects, supported by finance, legal and contracts specialists (**Flin** in energy and aviation; **Crawford** consults to test publishing companies).

c. Strategy and plans

While the School has a strong track record of applied research, an explicit management strategy to enhance impact potential of our research has the following principal mechanisms:
i) Fostering research excellence. Details of infrastructure, capacity building and recruitment strategy are described in the research environment document.
ii) Extending researchers' appreciation and knowledge of impact mechanisms. Staff with particular expertise in commercialisation, consultancy, outreach act as role models/ mentors for junior staff. Psychology postgraduate research students receive training from R & I on intellectual property, patents and commercialisation. Further training on applying and disseminating research is provided by the School and the College through regular briefings and workshops.
iii) Extending relationships with key stakeholders, policy makers. Research Theme Leaders are responsible for coordinating and monitoring external relationships with existing and potential users (e.g. patient groups, industry bodies, as well as policy/ advisory opportunities).
iv) Commercialisation and business development. The School Research Director works with Theme Leaders, researchers and R&I to identify research activities with commercial applications.
vi) External auditing mechanisms. Peer review, identification of good practice, benchmarking.
vii) Support is available from the School for development of knowledge transfer, in terms of specific pump priming funding and/ or sabbatical time for this purpose.

d. Relationship to case studies
The three case studies for this Unit are used to illustrate the impact strategy in practice.
1. Sight science rehabilitation of sight loss after brain injury. This research programme developed a new technique for rehabilitating vision in stroke patients using computer based visual stimulation training. The project was supported in the School with additional laboratory facilities and equipment, technical support, funding, research staffing. Public funding enabling research on visual impairments after brain injury, led to new insights on plasticity in the injured brain. R& I worked with investigators to secure the intellectual property by filing patent applications, granted in EU, Singapore, Switzerland, pending in USA. Commercial feasibility studies were conducted from Knowledge Transfer Funds, plus NESTA funding for market research. A spin out company *Sight Science Limited* was formed, funded by the proceeds from the feasibility study, which was then acquired within 3 years of operation, by a major international US company *NovaVision Inc.* The deal included research grants awarded as part of the commercial contract, enabling further basic and applied research in the University.
2. Quantitative methods for clinical assessment. A significant contribution to clinical assessment techniques has been made by this research by developing a large suite of novel, statistically sound and convenient quantitative methods for drawing inferences over the performance of an individual patient. The project is supported by the School's technical and computing specialists. All of the resulting methods have been implemented in tailored computer programs designed for practitioners; (currently over 70 such programs).
3. Non-technical skills for safe surgery. Research studies identified non-technical skills and devised behaviour rating tools for anaesthetists, surgeons and scrub nurses. Support was provided from R&I on contracts, joint copyright (e.g. with Royal College of Surgeons, Edinburgh; NHS Education) and technical input from the University's graphic designers to produce high quality materials for workplace assessment. Medical Illustration filmed video footage in operating theatres for practitioner training. School support enabled professional visits for the PI (ASB Visiting Fellow in Surgery, University Auckland (2005); Visiting Professor Queensland Health Simulation Centre (2009) to advise simulation tutors and run workshops to demonstrate the new tools to clinicians.