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| <p>Institution: Plymouth University</p> |
| <p>Unit of Assessment:UoA4</p> |
| <p>a. Context: Beneficiaries of our research include the public sector (health agencies in particular), policy-makers, local and national authorities and strategic bodies, the private sector, and the public. Our impact occurs predominantly in the research areas of health and well-being, and cognitive psychology. One important form of impact from our research is the development of evidence-based guidelines that have arisen from our academic work. This is relevant to policy-makers and health professionals both in the area of health and well-being, and to other policy-makers concerned with risk and safety in targeted areas. Guidelines have been developed in conjunction with professional bodies concerning (for example) anaesthesia monitoring (Andrade, underpinned by work on memory priming and levels of consciousness, working with The Royal College of Anaesthetists), health insurance decisions for older adults (Hanoch, underpinned by work on risk and decision making in older adults, working with the US Federal Drugs Agency), the use of antidepressants (Kirsch, underpinned by clinical trial data meta-analyses, working with NICE guidelines committees), train alert management (Edworthy and Hellier, underpinned by auditory cognition work, working with the UK Rail Safety and Standards Board), and driver safety (Hellier, underpinned by work on risk perception, working with Devon and Cornwall County Councils). In addition we have developed behaviour change programmes for use by both health professionals and patients. Here, projects have been developed to support patients with alcohol problems, and respiratory disease. The developments are underpinned by substantive theory (Andrade and May, underpinned by their Elaborated Intrusion Model of craving) and Hyland, (network theory approaches to the understanding of health and wellbeing), and for both there are freely-available websites with questionnaires and self-help materials for use by practitioners (for example GPs) and patients.</p> |
| <p>b. Approach to impact: Research in the School has followed many different pathways to impact and so we have engaged with key users and beneficiaries in a variety of ways. In some cases impact begins from a member of academic staff being contacted directly by (for example) policy-makers in the public or private sector wishing to improve on guidelines, best practice, or improve their products and services. In some cases this is achieved through publicity in the media, or via the Plymouth University or BPS directories of experts. In other cases impact can come about by contacts outside of academia which have been actively pursued by academic staff members. The school adopts a flexible and pro-active approach in forging these pathways.</p> <p>The School has sought to appoint staff with an existing or potential outward-facing aspect to their research to establish an impact-oriented research culture aligned with the University Enterprise strategy launched in 2008. This strategy placed greater emphasis on the need to engage with bodies outside academia with the aim (amongst others) of increasing impact, and the School proactively engaged with this strategy over the REF period, as we describe below. To embed this impact-oriented research in our teaching, a new Applied Psychology degree was launched in 2008. Related appointments include Hanoch and Chatzisarantis (replaced by Whalley) in Health Psychology, Pahl and White in the new priority area of sustainability, and Andrade and May in Applied Cognitive Psychology. These staff, and the subsequent appointments of Bessell and Deepro in Health psychology in 2012 added to existing strength of Edworthy, Hellier, and Hyland in applied psychology.</p> <p>In 2012, the Centre became one of the founding elements of the University's Cognition Institute. The Institute, supported financially from the University, is charged with developing both the capacity to deliver multi-disciplinary research projects, which may include external partners, and external engagement and outreach with local schools, the general public, and external agencies. With respect to the external engagement agenda, two academics have joint responsibility for outreach. Goslin is responsible for Schools liaison and outreach for Psychology whilst Coath is a full-time outreach research fellow for the Cognition Institute. They have jointly hosted many events increasing awareness of our research in the region, including involvement in initiatives such as "the Brain Game", "Brain Awareness Week", the National Science and Engineering week, and events at the Science Museum, Cardiff Science Festival, and Cheltenham Science Festival.</p> <p>In order to enhance impact capacity we have appointed a senior academic to lead policy development in this area, working as part of the management committee of the School of Psychology. Edworthy was appointed to this role because of her established track record of</p> |

Impact template (REF3a)

working across the academic and commercial fields. She runs impact-based staff-development workshops and has managed an annual budget that enables academic staff to undertake external training opportunities, visit organisations, attend launch events, or otherwise engage in impact-related activities at any stage of development. She has developed and promoted practices designed to develop and build our impact capacity and these have been built into Centre and School structures. Most recently, this work has focused on developing our ability to monitor the impact of our research, and to gather evidence about our impacts.

Specific mechanisms employed in our approach are:

- Research findings and their application are communicated through media publicity such as press releases, interviews, web-pages and so forth. For example, of a University press release on **Andrade's** research showing that doodling can aid attention garnered considerable media interest that led to great interest from teachers and educators (over 100 contacts after media publicity) and an invitation to act as an academic expert in a private company seeking to develop a practical application.
- We seek membership of, and respond positively to requests to join, profession-specific committees and groups for which our work is relevant. For example, **Edworthy** was invited to join the US Association for the Advancement of Medical Instrumentation alarms steering committee and has been able to directly influence new developments in medical alarms standardisation at a global level. Similarly, **Hyland** is a member of the International Primary Care Respiratory Group, a key group concerned with developments in respiratory care at an international level and Andrade is a panel member for the current National Audit Project on accidental awareness in general anaesthesia.
- We proactively seek direct commercial funding, and co-funding, where impact is typically incorporated into the day-to-day activities of the project. These include KTP awards, CASE awards, co-funded projects with bodies such as Great Western Research, and the University's own VC's Community Research Awards. For example, **Hellier** has successfully used co-funded KTP awards with both Devon and Cornwall County Councils to develop programmes of research and practical interventions in order to improve road safety. This has in turn led to further funding bids.
- We encourage and fund staff attendance at profession-specific conferences and/or meetings where our expertise is relevant, both as an opportunity to talk about work to relevant key users and to network outside of academia. We also maintain a network of impact opportunities through our undergraduate placement scheme. All academics are involved in creating links with non-academic users relevant to their personal research interests. Wherever possible, placement visits are used to identify potential opportunities for fruitful links with external agencies, and we are now highly systematic in monitoring, tracking and supporting these links, supported by a dedicated Faculty Placements Officer, and a School-based placements tutor. For example, **Hanoch's** research with the local probation and prison services developed in this way.
- We have encouraged collaborative and multi-disciplinary research wherever possible, maximising the opportunities for research impact. This is supported through membership of the University-wide Cognition Institute, as well as other university-wide research networks, particularly in health and medicine. For instance, **Hyland** has established the Plymouth Respiratory Psychology Partnership (with Jones, a local GP, and Masoli from the local NHS trust); **Whalley** leads the Plymouth arm of a large MRC-funded multi-centre trial on treatment for depression.

c. Strategy and plans: Over the period since 2008, the unit has developed its strategy and plans for increasing impact in the medium to long-term, in concert with University-led strategic developments. These strategies and plans reflect on the entirety of the research we undertake, and the approaches that we take, in order to identify how we can maximise impact through spreading best practice across the unit. Our strategy has 3 goals: 1) to embed interaction with third party and public sector beneficiaries and funders within the core of the unit's research activities through staff development processes, funding, and exploitation of the unit's developing knowledge in such activities; 2) to facilitate interdisciplinary research across the unit; and 3) to develop the many existing outward-facing activities in which the unit engages in terms of knowledge transfer and the impacts that may follow. These goals are pursued through a number of planned activities.

One is our involvement in, and support for, the Cognition Institute. A key future strategic development will be to broaden the impact of research in this area through interdisciplinary work, commercial development, and exploitation. The cross-disciplinary strengths of the Institute, which

Impact template (REF3a)

link CBCB, the Centre for Robotics and Neural Systems, and clinical scientists from the Medical School, mean that applications in health, biomedicine and bio-inspired technologies offer clear potential for future impact-led activity. The Institute is already in discussion with Optimise4, a company that runs brain injury rehabilitation centres and Wolfson Electronics, a world-leading audio electronics company. In 2013 it was awarded a €4.1Million EU training grant for 14 PhD studentships (with matched University funding for 12 more), involving 20 external partners, including Philips Research Laboratories and Guger Technologies. This project will substantially enhance our ability to deliver impact in the medium term.

We will continue to support our current areas of strength because our impact case studies have taught us the value of maintaining reputation and sustaining a network of external contacts. However, we need to extend our impact across a wider range of our research activity through investment in other areas. One priority area will be that of Sustainability. The Centre already has strong research links with the University's Institute for Sustainability Systems Research. In 2012, **Pahl** was awarded a £1.8Million EPSRC grant to lead a multi-disciplinary, multi-institution project on reducing energy wastage, involving a number of external agencies (e.g., The Energy Saving Trust). We intend to build on this success through strategic appointments as the opportunities arise, and through nurturing and developing relationships with the external agencies involved, and exploiting our strengthened school procedures for impact pathways and evidence management.

In line with University policy, we will also encourage an impact-led culture through explicit weighting of impact-related activities in our work-load allocation policies, in our performance monitoring and review processes, and in our promotion decisions, so that all staff are aware of the value of impact-related activity in their career development. Specific support and resources will be given to staff wishing to head impact-led grant applications such as interdisciplinary calls made by the research councils or NHS.

We need to develop and monitor our capacity to translate our broad strength across the research spectrum into clear and demonstrable impact. We will continue to use senior academic staff as impact champions and mentors to support and enable junior colleagues in developing and nurturing external links similar to those indicated above. We will ensure that all academics have appropriate training in this area, such as media training and workshops run by the University's Business Partners and KTP specialist advisers, and the University's Research and Innovation Division.

d. Relationship to case studies: The selected case studies are drawn from two areas in which we have historical strength: Human Factors and Health Psychology. For all four case studies, impact arose through the willingness of the researchers to engage with professional bodies with a direct interest in the potential application of the research. In each case, those bodies contacted the researchers because of their academic reputation, derived typically through their publications, which were of professional interest to them. The follow-through pattern is largely the same for each case study: the relevant staff member became aligned to one or more relevant professional bodies that either incorporated relevant research findings (as in the case of **Kirsch**), allowed the staff the scope and platform to develop practical tools (as in the case of **Hyland**), or allowed the researchers to gain access to funders, which subsequently resulted in impact (as in the case of **Edworthy** and **Hellier**). The research that underpins the impact was typically co-authored by non-psychologists (in the case of **Kirsch** and **Hyland**, these were often medical experts, for example) and/or published in journals read by professional practitioners (*British Medical Journal*, *Ergonomics*). In **Hellier's** case, knowledge transfer was the key component of the manner in which impact developed, in the form of two KTPs.

Reflection on these case studies, as examples of best practice, has enabled us to encapsulate their successes in our strategy and plans for impact (Section 3). In particular, the time, effort and resources that unit staff need to engage in work that may eventually lead to impact is now recognised as a core activity of the school, and is thus appropriately funded, encouraged, and supported on an equal footing with other research activities (strategic goal 1). Interdisciplinary work, so important in terms of gaining the attention of relevant beneficiaries, has been embedded into the unit's strategy through the Cognition Institute (strategic goal 2). In terms of knowledge transfer (strategic goal 3), we now have practical knowledge and expertise, and increased support from business partners within the university.