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| <p>Institution: University of Liverpool</p> <hr/> <p>Unit of Assessment: 4 - Psychology, Psychiatry and Neuroscience</p> <hr/> <p>a. Overview</p> <p>The Department of Psychological Sciences at the University of Liverpool (UoL) is the largest department in the Institute of Psychology, Health and Society (IPHS), which is part of the Faculty of Health and Life Sciences. The Department consists of seven research groups. Each conducts theory-driven multi-methodological translational research and maximizes its real world impact by developing effective interventions for healthcare, security, business, industry, and third sector organisations, whilst informing policy locally and globally.</p> <p>During the REF period, UoL staff in psychology, psychiatry and related disciplines published more than 600 peer-review papers, which were cited more than 4,000 times. Our research groups, with some of their key achievements during this time, are (i) Addiction: establishing the roles of attention and executive control processes in alcohol consumption and problem drinking (e.g. <i>Field et al., 2009, Psychological Bulletin</i>); (ii) Appetite and Obesity: demonstrating the effects of advertising and marketing on children's eating behaviour (e.g. <i>Boyland et al., 2011, Pediatrics; Halford et al., 2008, Public Health Nutrition</i>); (iii) Forensic and Investigative Psychology: creating simulated environments that improve critical incident decisions and discovering effective and ethical methods of interrogating suspected terrorists (<i>Alison et al., 2013, JEP Applied., Alison et al., 2013, Psychology, Public Policy, and Law</i>); (iv) Language & Development: establishing how children's linguistic representations change and impact on the sentences they produce over the course of development (e.g. <i>Jones et al., 2013, Developmental Science; Pine et al., 2013, Cognition; Rowland et al., 2012, Cognition</i>); (v) Mental Health in Context: establishing how social environment and developmental processes cause psychopathology and creating psychological interventions for difficult-to-treat and geographically remote and disadvantaged groups (<i>Morrison et al., 2012, BMJ; Rahman et al., 2008, The Lancet; Sharp et al., 2012, PLOS One; Varese et al., 2012, Schizophrenia Bulletin</i>); (vi) Perception: building models of how the brain integrates information across different senses (<i>Fallon et al., 2013, Neuroimage: Clinical; Meyer et al., 2011, Journal of Cognitive Neuroscience; Parkes et al., 2009 Journal of Vision</i>); (vii) Psychology of Healthcare: identifying strategies that enhance or impede doctor-patient communication (<i>Forsey et al., 2012, Psych-oncology; Mendick et al., 2010, Social Science and Medicine</i>).</p> <p>These achievements reflect our five point research strategy: (i) targeting recruitment of staff to strengthen groups; (ii) developing cross-disciplinary links and providing pump-prime funding to support these developments, and (iii) translating lab-based research into real-world impact on health and well-being. This has been supported by (iv) a refocusing of teaching commitments to align them with research activity and (v) investment at Institute, Faculty and University level in the necessary infrastructure to support multi-methodological research. This strategy has resulted in a doubling of awards 2008-2013 compared to the previous RAE year period (from £6M to £15M).</p> <p>b. Research strategy</p> <p>The Department, one of three in IPHS, was created as a strategic initiative to enhance our focus on theory-driven research that translates into real world benefits, following a 2009 external review of UoL's psychology activity. It was created from four separate units previously located in different faculties (Experimental Psychology; Applied Psychology; Clinical Psychology; Psychiatry) that were represented across our UoA7 (Health Services Research), UoA12 (Allied Health Professions and Studies) and UoA44 (Psychology) returns in RAE2008.</p> <p>The Department's strategy maximises strength by building capacity around its seven thematic groups. This is being achieved by targeting recruitment of staff to strengthen groups (strategic aim i). For example, since RAE2008 we have recruited to Addiction (Christiansen, Rose: human psychopharmacology and alcohol use disorders); Forensic & Investigative Psychology (Thorley, Waring: eyewitness memory and naturalistic decision making); Mental Health in Context (Bentall, Corcoran, Eames, Read, and Taylor: psychology and treatment of severe mental illness; Slade: psychopathology and women's health); and Psychology of Healthcare (Noble: recovery from neurological conditions). We have also expanded the range of methods available to the groups by appointments to Language & Development (Chang, Gobet: computational modelling) and Perception (Makin: EEG). Cross-group appointments achieve our aim of promoting cross-disciplinary multi-methodological research targeted at high impact interdisciplinary journals (aims i</p> |
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& ii); in **Addiction** and **Appetite & Obesity** (Boyland, Hardman, Robinson: cognitive and social processes involved in appetitively-motivated behaviour); **Forensic & Investigative Psychology** and **Language & Development** (Gobet: computational modelling and its application to expertise and language development).

Our priorities align with four of the University's cross-faculty Research Themes (Changing Cultures, Global Health, Personalised Health, and Security and Conflict), enabling us to take advantage of pump-priming opportunities to develop multidisciplinary research (e.g. between Computer Science and **Language & Development** to develop the BabyTalk app) and to target international and national funding bodies (e.g. ESRC, EU), allowing us to forge links with overseas partners (e.g. between **Appetite & Obesity** and the Brazilian National Institute of Cancer (INCA; aim ii). Through the Technology Directorate (which manages UoL's shared research facilities), the Department shares facilities with other parts of the University and will continue to provide expertise and training in EEG and eye tracking systems (aim v). To increase the real world impact of its research, the Department works with the University's industry liaison team in Business Gateway to identify non-academic research partners in healthcare, security, business, industry and third sector organisations, locally and globally (aim iv; the detailed strategy is described in REF 3a).

We have invested in research infrastructure, to enable groups to expand their range of multi-methodological activity and to facilitate an increase in productivity (aim v; see d. below). Key investments include a recent £3.6M modernization of the Waterhouse Building and the purchase of shared departmental resources (e.g. eye tracking and EEG equipment) as well as bespoke laboratory facilities for expanding research groups (e.g. for **Addiction** and **Appetite & Obesity**). The University's extensive £600M capital investment programme will provide new facilities within the next six years, to facilitate further growth. The creation of the new Department has also been associated with increased grant capture, with a positive knock-on effect on infrastructure and staff.

Our five year strategy going forward is to (i) establish two Centres of Excellence (Mental Health and Language Development) in collaboration with the Universities of Manchester and Lancaster; (ii) maximise the opportunities for large scale international collaboration in health and security through Horizon 2020 funding opportunities; (ii) use departmental cross-cutting themes (Neuroscience, Mother-Infant Interaction and Expertise and Decision-Making) to generate interdisciplinary collaborations within Psychological Sciences; (iii) use the University's research themes (see above) to develop interdisciplinary collaborations; (iv) invest in major projects with potential for significant and widespread impact, and (v) support early career researchers (ECRs) to establish independent research programmes and maximise their success with large Research Council applications.

(i) Research Groups

Addiction (Field, Christiansen): The goal of this group is to identify the cognitive and psychopharmacological processes involved in alcohol consumption, and to translate this into real world impact by developing innovative interventions to reduce problem drinking. Key achievements include (i) characterisation of the role of attentional biases in substance use disorders; (ii) identification of a key role for state disinhibition in alcohol use disorders, and (iii) the first demonstration of a role for individual differences in impulsivity in the transition to heavy drinking during adolescence. Funding from the MRC, Wellcome Trust, ESRC, Alcohol Research UK and Liverpool PCT (£940K) has supported this research. The group is engaged in multidisciplinary collaborations locally (Liverpool Alcohol Research Collaborative), nationally (MRC-funded UK Centre for Tobacco & Alcohol Studies) and internationally through work with colleagues in the UK, Netherlands, USA and Australia. With collaborators, the group seeks funding from NIHR (e.g. RfPB) and the MRC to investigate pathways into alcohol treatment for populations that are hard to reach (e.g. adolescents), hard to engage (e.g. dementia), or at high risk (e.g. liver disease patients). We are translating lab findings into interventions via the development of web and smartphone self-control training programs (MRC-funded) and by hands-on engagement with national charities to promote addiction awareness (e.g. Alcohol Concern's Dry January campaign).

Appetite and Obesity (Boyland, Halford, Hardman, Robinson): The goal of the group's research is to understand the complex psychological and biological processes that control appetite and energy balance, and how social and environmental influences affect their expression. This research pursues the development of effective approaches to intake and weight management and informs health policy in relation to obesity. The strengths of this group arise from the amalgamation of expertise in different aspects of appetite research, from social psychological to physiological

factors. State-of-the-art research facilities have attracted funding for the identification, development and assessment of functional foods to improve the diet and health of consumers and for research on pharmaceutical and nutraceutical agents for the treatment of obesity (£2.1M during the REF period from EC, MRC-NPRI, BBSRC-/ESRC-CASE, Liverpool PCT & industry). The group's work on the influence of food advertising on food choice, consumption and weight in children has had widespread impact, especially on the formation of governmental policy on the advertising of high fat, high sugar food and drinks to children. This has been achieved through work with the International Association for the Study of Obesity's STANMARK committee, the European Childhood Obesity Group and the World Health Organisation (WHO). The group's multidisciplinary approach and expertise were recognized in the award of the €6M Framework 7 Satiety Innovation SATIN project (www.satin-satiety.eu), with an additional €2M from industry, in which we coordinate a consortium of seven SMEs, four international industry partners and seven leading European academic institutions. This work combines psychological and biological methods with innovative food processing technologies to develop novel foods for appetite and weight control.

Investigative and Forensic (*Alison, McGuire*): The goal of the group's research is to understand the cognitive and social factors that underpin risk-based decisions and choices, specifically with respect to the criminal justice sector, security services and the defence industry. Key strengths include the development of: (i) practitioner-friendly evidence-based tools to assess vulnerability and interventions for violence (Home Office); (ii) rational choice models to identify and inoculate against violent extremism and radicalisation (Office of Security and Counter Terrorism); and (iii) scenario-based learning to examine the impact of accountability and time pressure on decision inertia in command and control (Metropolitan Police). We contribute to UoL's newly established Institute of Risk and Uncertainty, a £10M investment providing a new interdisciplinary centre for the University's expertise in quantifying, mitigating and managing risk and uncertainty. A multi-disciplinary, cross-institutional, six partner €1.43 million EU European Commission grant examines how to identify contact offenders from their use of indecent images of children. Work on rapport-building strategies for the ethical and effective interviewing of high value targets is currently being considered as part of the FBI's terrorist interview training programmes (£650K during the REF period). Work on national intervention programs for reducing violence and responding to behaviour/substance abuse has resulted in a process through which 42 offending behaviour/substance abuse programmes have been accredited for use in penal settings across the UK. The group is the academic hub of the 'HYDRA Foundation', with 72 training installations for police, security and emergency services in the UK, US, Canada, Australia and Ireland. We therefore have a global immersive learning laboratory and unique engagement with end-users, allowing us to feed theory-driven research directly into design and delivery of training. Recent cross-disciplinary (Engineering, Computer Science, Law and Philosophy, The new Institute of Risk and Uncertainty), inter-institutional (Leeds University Business School, VU University Amsterdam, Merseyside Fire & Rescue, LAPD, Norwegian Police Academy and New South Wales Police) innovations have been exploited to examine the use of autonomous systems to assist decision-makers in their response to, and management of, critical incidents. This will result in a €2.5 million EU bid for Horizon 2020 funding.

Language & Development (*Ambridge, Gobet, Pine, Rowland*): The goal of the group's research is to build well-specified, mechanistic models of how children acquire language, with an emphasis on exploring how the child's learning mechanisms respond to their environment. The work provides a robust empirical evidence-base for the design of effective language-promoting interventions in early years education and healthcare. Key achievements are (i) computational work that simulates dynamic changes in language production and comprehension across development; (ii) experimental work that addresses developmental changes in the way language structure is represented in the brain, and (iii) naturalistic work that assesses the impact on development of individual and cross-linguistic variation in child-directed speech. Over the assessment period, our researchers and their collaborators have attracted £907K from the ESRC (four grants), the Leverhulme Trust (three grants), the Nuffield Foundation, the British Academy and the Joseph Rowntree Foundation. The group has long-standing multidisciplinary collaborations regionally (with Lancaster and Manchester Universities), nationally (e.g. with Lincoln and Lancaster on the ESRC-funded UK-CDI project, and with Sheffield on the Nuffield-funded early intervention project) and internationally through work with colleagues in the MPI-EVA (Leipzig), in Australia (ANU), the USA (Princeton, Illinois) and Hong Kong (Hong Kong Polytechnic University). The

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group's growing reputation for cutting edge research has enabled it to maximise the translational impact of its research; attracting awards to develop commercial language assessment instruments (ESRC, EPSRC) and to design and evaluate family-based early intervention programmes (Nuffield). Our priority going forward is to establish a North West Centre for Language & Communicative Development in collaboration with Manchester and Lancaster Universities and allied institutions abroad (in Germany, Australia, Poland, Switzerland & USA). A £9.6 million bid to ESRC's Centre & Large Grant Competition is under consideration.

Mental Health in Context (*Bentall, Brown, Corcoran, Eames, Fisher, Kinderman, Rahman, Read, Sharp, Slade, Taylor, Wilson*): The group's goal is to (i) increase understanding of social, psychological and physiological processes involved in developmental pathways to, and persistence of, mental health problems from childhood to adulthood, and (ii) develop and evaluate new psychological interventions to improve mental health nationally and globally. Domains of enquiry include childhood behavioural and emotional disorders, adult anxiety disorders, depression and trauma, and symptoms of psychosis. The group's key achievements include (i) demonstrating that early life trauma is an important risk factor for the development of symptoms of psychosis, and identifying the psychological mechanisms that may explain this association; (ii) establishing the MRC-funded Wirral Child Health and Development Study designed to identify the earliest social, emotional and biological origins of antisocial behaviour: this study was the first to show early tactile stimulation by parents reverses adverse effects of prenatal stress on key human infant outcomes; (iii) designing, and proving the efficacy of, low intensity psychological treatments for postnatal depression in rural Pakistan (now integrated into WHO and UNICEF maternal and child health programmes). We have also (iv) demonstrated universal prevention of postnatal depression via brief psychological intervention in UK pregnant mothers. Key strengths arise from the interplay between expertise in basic science and as clinicians, enabling us to identify important processes involved in the development of disorders and to translate core findings into the development and evaluation of new targeted interventions. Over the assessment period the group has received more than £4.8M funding from the MRC, Wellcome Trust, British Council, NIHR (UK), HTA-NIHR, BUPA, and MHRN, and internationally from NIH (US), USAID, and Higher Education Commission Pakistan. Impact is achieved through public engagement with the national debate about mental health (e.g. BBC) and representation on national and international advisory panels (e.g. BPS, UNICEF). Future activity will be boosted by the appointment of two new senior positions in psychiatry, jointly funded with the NHS. With colleagues at Manchester and Lancaster Universities, the group is establishing a North West Mental Health and Wellbeing Alliance, supported by priming funds from the three institutions, and with the ambition of creating a North West Centre of Excellence. Through the recent award of a NIHR grant (£9M plus matching funds from local stakeholders) to establish the North West Coast CLAHRC (with Lancaster, UCLAN and Liverpool CCG, with mental health inequalities as a major theme) research is extending into the domain of public mental health.

Perception (*Bertamini, Garcia-Finana, Makin, Meyer, Stancak, Wuerger*): This group's goal is to understand human perceptual processes and how the brain integrates information across different senses (vision, audition, haptics, olfaction, pain). Our researchers translate basic behavioural and neuroscience research into clinically-relevant applications and link it to human factors in industrial settings. Key achievements include (i) the development of working models of the neurophysiological mechanisms of chronic pain; (ii) the discovery that the engagement of an observer with a stimulus is key to the generation of a response to visual art, and (iii) the development of integrated models of how the different senses are combined to create perceptual representations of the world and of the self. Over the REF period, the group has received £981K from the Leverhulme Trust, Glaucoma Society, BBSRC, ESRC, EPSRC, AHRC, Royal Academy of Engineering, EPS, Technology Strategy Board, Pain Relief Foundation and Unilever, as well as a three year Leverhulme research fellowships and CASE PhD studentships (ESRC/EPSRC/BBSRC). The group has established strong collaborative links with multi-disciplinary academic groups, engineering and industry, to develop applications to improve flight passenger comfort (GE Avionics/Dowty, the Dutch National Aerospace Laboratory (NLR)), improve driving performance and safety (Jaguar Land Rover) and to develop virtual reality 'presence' (Virtual Engineering Centre). Members also collaborate with clinicians at the Royal Liverpool University Hospital to develop treatments for glaucoma and diabetic retinopathy (TSB). The group has recently established the North West Perception-Action Network, through which we are

planning large scale collaborative projects to apply their work on vision and multisensory perception to future health challenges, such as the ageing perceptual system (Lifelong Health and Wellbeing; ESRC/MRC), and to develop innovative solutions in health and assistive technology.

Psychology of Healthcare (Noble, Salmon, Young): Working at the interface of psychological and physical health, this group studies how cognitive and affective processes shape health needs, and how these processes impact on clinical communication so that these needs are either met or thwarted. This is realised through specific programmes in perinatal and paediatric care, primary care, neurology and cancer. Key achievements include: (i) demonstrating how General Practitioners' emotional needs shape the quality of their clinical communication; (ii) completing the first study to demonstrate that meta-cognitive therapy can treat emotional distress in cancer survivors, and (iii) demonstrating that effective patient-practitioner relationships are based on practitioners' conscientious execution of their role, rather than on overt emotional engagement. Over the review period, the group has (i) developed local clinical-academic networks that will sustain their research; (ii) built the networks to sustain the quality and reach of research at an international level; (iii) diversified from predominantly research council and research charity funding to include NHS and NIHR funding (£1.8M), and (iv) targeted fellowships to build the next generation of researchers. This strategy has achieved considerable success, including (i) establishment of a 'beacon' psychology service for cancer patients in partnership with local NHS Trusts (including four NHS-funded University posts) which provides a laboratory for the group's work on psychological therapy in cancer and on clinical communication practice and education; (ii) grants and published outputs demonstrating successful collaborations (e.g. with Johns Hopkins, LaTrobe and Sydney); (iii) funding during the review period worth >£6.5M to Liverpool, including NIHR (two programmes) and MRC; and (iv) five current doctoral and post-doctoral fellows (MRC, Wellcome, NIHR). These achievements provide the platform for our research for the next five years. These include exploiting the group's expertise in 'new wave' cognitive therapy to develop and evaluate new psychological therapies in cancer and heart disease (NIHR application pending), exploiting its health psychology expertise to build research in clinical decision-making and to inform health promotion strategies (two ESRC grants) and consolidating work addressing challenges in clinical communication, including recruitment to clinical trials (MRC programme renewal).

c. People

(i) Staffing strategy and staff development. In addition to academic staff, the Department employs 14 support staff and 54 contract research staff. In addition, the managerially separate School of Psychology, based in the Faculty's Institute of Learning and Teaching (ILT), with 10 full time and seven 0.5 FTE staff on teaching and scholarship contracts, is responsible for delivering undergraduate and MSc programmes. This releases research-active staff from some teaching and administrative duties (e.g. Departmental staff have fewer first year tutees and do not have large administrative jobs such as Undergraduate Admissions, which are allocated to School staff).

The Department's *retention and recruitment strategy* maximises the strength of the research groups. *New senior level appointments* are made by a panel including the VC and external advisors, and receive a package of support, usually including a postdoctoral researcher and PhD student, designed to enable them to establish their research at UoL as quickly as possible. *ECRs* are given light teaching loads during the first two years, a substantial start-up package and an Institute-funded PhD studentship to enable them to establish research programmes quickly. This strategy has allowed us to return a large number of ECRs (Boyland, Christiansen, Eames, Makin, Noble, Robinson, Taylor).

We have fully implemented the Concordat to support the Career Development of Researchers and have achieved the EU HR Badge of Excellence, with a particular emphasis on supporting ECRs and contract research staff. For example, requests for additional support from ECRs are prioritised within the Department and the Institute, and they also receive preferential access to the Faculty's Technology Directorate voucher scheme, giving them funded access to research facilities across the campus. The Department has also improved the job security of *researchers on fixed term contracts*. The Institute's rolling three year budget allows us to consolidate small research grants and provide bridging money to enhance contract continuity. Both ECRs and contract research staff are represented on the Institute's Senior Management Team.

Women have always been well represented at lecturer and senior lecturer level. The Department has actively worked to increase representation at chair level, with the appointment of four female professors in the last two years. Our institutional Diversity & Equality policy and

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Institute level Athena Swan group ensures monitoring of recruitment, retention and promotion, communicating opportunities for flexible working and special leave, and making recommendations for gender-equalising initiatives. For example, together with the University of Manchester, we have set up a cross-institute mentoring initiative designed to promote women academics.

The Department is working to increase the number of clinical academics (particularly in Psychiatry), to reinforce multi-methodological activity and strength impact. Four of the Department's research-active academic staff are partially funded by the NHS and have consultant psychiatry posts; some clinical psychologists have honorary NHS appointments. All GMC-registered medically qualified staff are subject to 'Follett' joint appraisals (the HoD and the relevant NHS manager, usually the Medical Director, agree joint job plans). All HPC-registered clinical psychologists are supported in having clinical involvement (between 0.1 and 0.2 FTE) with the aim of sustaining clinical awareness and reinforcing links with NHS mental health services.

The career development of both non-clinical and clinical researchers is supported via an extensive staff development programme (e.g. Research Leadership Training for future research leaders) and via an annual cycle of personal development review (PDR) meetings. These are confidential meetings between a staff member and their Head of Department (or his/her representative) which are designed to (i) foster a shared understanding of the plans and priorities of the University and individual roles; (ii) allow for an open and constructive dialogue on the nature and contribution to activities; (iii) establish a clear and common understanding of each researcher's career trajectory and longer term aspirations, and (iv) provide an opportunity for researchers to discuss any issues or personal circumstances that have impeded progress and plan how to manage these. Contract researchers, as well as permanent members of staff, take part in the annual PDR process, which provides the framework for an annual review of career and personal development beyond the life of any particular current project.

Staff are supported to deliver research integrity by University, Faculty and Institute. UoL is a member of the UK Office for Research Integrity (UKRIO) and the Department plays a central role in the University's Research Governance Framework. The Head of the Institute is also the Academic Lead for Research Governance, and a number of Department members sit on UoL's Research Ethics Committees (RECs: Halford, Harrold, Rowland). Departmental members were instrumental in the creation of the University's research ethics policies (e.g. procedures for research with children and for research with food). All research gains prior ethical approval from an external committee (e.g. NRES), the University's RECs or the Institute sub-committee (for low-risk studies). To increase the efficiency of the approval process, research sponsorship approval for clinical studies, until now regulated by a separate UoL-NHS sponsorship committee, is being brought into the Department from 2014.

Finally, there are more informal mechanisms for sustaining and enlarging the research culture within and across research groups. *Addiction* and *Appetite and Obesity* run joint group meetings and journal clubs for research discussion, especially amongst PhD students and RAs; *Mental Health* has a regular psychopathology seminar programme attended by NHS staff and service users; and *Perception* has an active seminar programme of weekly meetings with a mix of external speakers, presentations of new data, journal article discussions and practice conference presentations. *Language & Development* runs both a group-specific and a regional reading group (with members across the north and midlands of England), and runs an annual regional conference at which students and early career researchers can present, and receive feedback for, work in progress. The central forum for the *Psychology of Healthcare* group is a bi-monthly meeting of the Psycho-oncology and Clinical Communication Forum, attended by the group's academic and research staff and psychological practitioners in local NHS Trusts.

(ii) Research students. The Department has a large PGR community, with 83 students registered for PhDs and a further 72 students on the taught doctorate in clinical psychology (D.Clin.Psychol.). All of the Department's research students work within one of the research groups and most are funded either by Research Council studentships or by the Institute itself (often in collaboration with non-academic partners from the private and public sector). All PGR students are supported by an integrated package of Research Postgraduate Training, which includes generic skills training (provided by the PGR Development Team), specialist subject-specific training (provided by the Institute) and cross-institution training that pools expertise across all three Universities in the recently established North West Doctoral Training Centre (DTC; the largest of the ESRC's with Lancaster and Manchester). Students have access to a range of specialist modules on topics

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ranging from advanced qualitative methods to the use of mixed effect models, and receive on-the-job training in techniques ranging from EEG and fMRI to eye-tracking and computational modelling. Student progress is carefully monitored through the PGR development programme, with all students attending at least one documented supervision meeting per month, and undergoing annual review by an independent panel to which they are required to submit a detailed thesis plan and piece of written work. Recent growth in PGR numbers has seen the development of a vibrant PGR culture, which includes a student-led PGR group that organizes its own meetings, maintains its own web interface, and has recently taken over the organisation of the annual PGR conference, at which all PGR students are required to present their work. PGR students attend and present at research group lab meetings, are funded to present at national and international conferences (through bench fees, Departmental funds and University competitive bursaries), and publish in international peer-reviewed journals. Students benefit from cross-institution events run through the DTC, including a regular Doctoral Research Clinic and an annual postgraduate conference.

Through the DTC, the Department has access to ESRC studentships. Psychology at Liverpool has been particularly successful, gaining 10 studentships in the first three years, representing 27% of all the studentships awarded to Liverpool, and 42% of all those awarded to Psychological Sciences across the three partner Institutions. One of the reasons for this success has been the Department's ability to recruit non-academic partners for its PG research, including private sector partners (e.g. Sony, Coca-Cola, Unilever, Jaguar Land Rover, Tate and Lyle, and Weight Watchers), public sector partners (e.g. the Metropolitan Police, the Primary Care Trust and the Mersey Care Trust), and charities (e.g. Alcohol Research UK and the Pain Relief Foundation). The Institute currently hosts 11 CASE studentships (seven ESRC, three BBSRC and one EPSRC).

Another reason for success is the close integration of the Department with the School of Psychology. We share a focus on training potential PGR students throughout taught degree programmes and have jointly established research intern and summer placement schemes. Through these, together with undergraduate and MSc research projects, students are given access to, and become active members of, our research groups. Hence, our students are already able to evidence extensive research experience when they apply to competitive PGR funding schemes. UoL has been shortlisted for the Prospects Best University Campaign prize for our work on demystifying postgraduate study for undergraduates.

d. Income, infrastructure and facilities

Effective internal review and support structures have led to an increase in awards from £6M between 2007/08 and 2009/10 to £9.5M between 2010/11 and 2012/13. This includes awards from the EU, UKRCs (ESRC, MRC, BBSRC, EPSRC, AHRC, Technology Strategy Board), the public sector (e.g. NIHR, NHS, Home Office, Metropolitan Police), the private sector (e.g. Coca-Cola, California Prune Board, Ingredion, Unilever, GE Avionics/Dowty, Jaguar Land Rover) and third sector organisations (e.g. the Leverhulme Trust, Nuffield Foundation, British Academy, Joseph Rowntree Foundation, Wellcome Trust, Alcohol Research UK). The University has also made significant investment in the Department's research infrastructure and facilities, including laboratories:

- *EEG laboratory*, equipped with two Faraday cages, to assess spatiotemporal activation patterns in the human cortex during cognitive, emotional and perceptual processing. The laboratory has 128-channel EGI and 64-channel Biosemi amplifier systems, a 3-D Patriot spatial tracking device allowing measurement of head contours and EEG electrode locations, a digital pen that allows measurement and recording of landmark points on the head. This information can be combined with data acquired in UoL's Magnetic Resonance and Image Analysis Research Centre (MARIARC).
- *Eye tracking laboratory* including a desk mounted eye-tracking system, which records information at speeds of up to 360 Hz, with a built-in video head-tracking system (D6 by Applied Science Laboratories, and Bedford, Madison, USA) and a high speed, head mounted, eye tracker (ASL-5000), designed to be worn in natural environments and equipped with a scene camera that records the environment.
- *Visual and audio-visual laboratories* with 3D audio-visual facilities to present spatialised visual and auditory stimuli, including Cambridge Research Systems ViSaGe visual stimulus generators and a range of 3D monitors (from passive polarised 23' 3D displays to an active shuttered 52' Sony Bravia 9-52 display). The visual displays are complemented by Tucker Davies audio processors

that enable us to present spatialised audio. We have two *specialised testing rooms* (IAC 1202) with silent ventilation systems and acoustic doors and windows, which provide a silent and echo-reduced environment for behavioural testing. One of the chambers is equipped with a VeriVide daylight simulator for ambient lighting control.

- *The Lauries Study Centre* in Birkenhead: a purpose-designed, community-based research facility funded by the MRC to host the Wirral Child Health and Development Study, a collaborative project with Manchester University and three local NHS Trusts. Facilities within the Centre include a large multi-desk office for the team of 15 research staff, two parent interview rooms and four observation suites with capacity for synchronised camera, sound and physiological recordings and covert infant behavioural observation through one way mirrors.
- *Hydra Suite* including a 10Kv debriefing system; a purpose built immersive training environment for incident commanders (developed with the Metropolitan Police), which affords the collection of data in a controlled laboratory setting. The 10Kv debriefing system is an anonymous computer-based method of collecting non-attributable information from emergency services personnel after major and critical incidents. The Department is now planning an extension to two mobile systems, which enable the study of decision-making processes in the field.
- *Kissileff Laboratory for the Study of Ingestive Behaviour*: the largest dedicated academic unit of its kind in the UK, enabling integrated research into a broad spectrum of psychological, biological and social factors that influence eating and body weight. The laboratory provides specialized facilities for behavioural testing, meal pattern monitoring, physiological assays (including an iDXA body composition scanner), the collection and storage of biological samples, and observational studies of infant-parent feeding interactions.

Through the *Technology Directorate* (established in 2011 to facilitate shared use of large scale research facilities), the Department has access to expertise and equipment across the University. This includes MARIARC which has two magnetic resonance scanners, a Siemens Trio 3T and Siemens Symphony 1.5T, supported by a manufacturers' service agreement. Research on the Symphony instrument concentrates on body fat composition by magnetic resonance imaging (MRI) measurement of muscle and liver lipids by proton magnetic resonance spectroscopy (1H MRS), and various kinds of anatomical MRI. The Trio allows multimodal neuroimaging, including blood-oxygen level dependent (BOLD) fMRI, arterial spin labelling (ASL) perfusion imaging, quantitative structural MRI and diffusion-weighted imaging (DWI); and 31P MRS of skeletal muscle. Other modalities available include functional trans-cranial Doppler (fTCD) and muscle near-infrared spectroscopy (NIRS). Ancillary equipment includes stimulus presentation facilities (visual, cognitive, touch, pain, appetite) and software, response boxes; eye-tracking equipment; and exercise rigs for muscle work.

e. Collaboration and contribution to the discipline or research base

A number of staff are members of **grant awarding committees**: Kinderman: North West Research for Patient Benefit (RfPB) Grant Committee; Gobet: Agence Nationale de la Recherche (France) (2012-13); Rahman: UK National Institute of Health Research (NIHR) Member of the Sub-Panel for Programme Grants in Applied Research (2009-11); Salmon: MRC Health Services and Health of the Public Panel (2006-2009), Biostatistics, Population Health and Methodology Panel (2009-10), ESRC/MRC Fellowships and Studentships Panel (2009); Young: UK member of NIHR Sub-Panel for Programme Grants in Applied Research (2009- 2013).

The following are members of **editorial boards**: Bentall (Cognitive Neuropsychiatry & Clinical Psychology Review); Bertamini (Art & Perception); Halford (British Journal of Nutrition), Slade (Journal Reproductive & Infant Psychology, Journal Psychosomatic Obstetrics & Gynaecology).

The following have **associate editorships or similar positions**: Bentall (Psychosis & British Journal of Clinical Psychology, up to 2011); Bertamini (Acta Psychologica); Field (Addiction, Drug & Alcohol Dependence, Journal of Experimental Psychopathology); Boyland and Halford (Guest Editors for Appetite 2013), McGuire (Legal & Criminological Psychology, 2000-2011, Psychology, Crime & Law, Personality & Mental Health; Integrar: Revista de Reinserção Social e Prova). Meyer (Special issue on Multisensory Processing in Experimental Brain Research); Rowland (Journal of Child Language, Trends in Language Acquisition Research); Salmon (Patient Education & Counseling) Wuerger (Seeing & Perceiving; Frontiers in Perception Science).

The following have **visiting chairs or similar appointments**: Bentall: visiting Professor at Bangor, Durham and Manchester Universities; Field: visiting Professor at Maastricht University

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(2011); Gobet: visiting professor at University of Sydney and Bathurst (2010-2011), Research Associate at the Centre for Philosophy of Natural & Social Science, London School of Economics; McGuire: Special Professor, Forensic Mental Health, School of Community Health Sciences, University of Nottingham (2007- 2010); Salmon distinguished fellow and visiting Professor at LaTrobe University, Melbourne (2008); Rahman: visiting Professor of child psychiatry at the Institute of Psychiatry, Rawalpindi; adjunct Professor, the University of Health Sciences, Lahore; member of Board of Studies, Health Services Academy, Islamabad.

Finally, Bentall is a Fellow of the British Psychological Society; Field received the BPS Spearman Medal in 2009 and Kinderman is an Academician in the Academy of Social Sciences.

National engagement. *Appetite and Obesity* collaborated with Liverpool PCT and Liverpool City Council on their Healthy Weight Strategy and Halford is Chair of the UK Association for the Study of Obesity (ASO). *Forensic and Investigative Psychology* work with the Association of Chief Police Officers on armed policing, football policing, and terrorism and work with NPIA, HO OSCT, and ACPO TAM on a screening tool for violent extremists and are involved in drugs expert witness training nationally. Alison is co-director of the HYDRA foundation, which provides national scenario-based training to police and associate emergency services across 72 sites in six countries. McGuire is a member of the Correctional Services Advisory and Accreditation Panel, the National Offender Management Service, and a member of the Guideline Development Group on Antisocial Personality Disorder for the National Institute of Health and Clinical Excellence (NICE). In *Perception*, Bertamini is secretary of the Applied Vision Association, a charity with about 400 members and in *Psychology of Healthcare*, Slade is Chair Elect for the BPS Faculty of Perinatal Psychology. In *Mental Health in Context*, Kinderman is a member of Liverpool City Council Health and Well-Being Board, a governor of Wirral University Teaching Hospital NHS Foundation Trust, and a member of the Office for National Statistics Technical Advisory Group for the measurement of national well-being. He was Chair of the British Psychological Society Division of Clinical Psychology (2004-5, 2010-11) and president of the Human Rights Committee, Mental Health Europe – Sante Mentale Europe (2007-9), was a member of the European Union Fundamental Rights Agency Fundamental Rights Platform Advisory Panel (2008-2012) and was also a member of the UK Government's Ministerial Advisory Group on Mental Health (2008-10).

Contribution to international organisations: Alison is academic director for the HYDRA user group, the key advisor for all 10,000 Volt operational debriefs of critical and major incidents and lead academic partner on the KIRAT risk assessment European Commission Project; Bentall was a member of NIMH expert group on the measurement of social cognition in psychosis (2008); Boyland is a member of the International Association for the Study of Obesity's STANMARK committee, the European Childhood Obesity Group and the Canadian Obesity Network. Rahman was a member of the New York Academy of Sciences experts meeting to review and evaluate the effectiveness of strategies that combine interventions to improve child nutrition and early child development, 2012; and at the US National Institute of Mental Health, Office for Research on Disparities and Global Mental Health, Bethesda, USA experts meeting on Grand Challenges in Global Mental Health, 2012. He was a WHO temporary advisor at a meeting to develop a global consensus on preconception care to reduce maternal and childhood mortality and morbidity, (2012), a member of the Guidelines Development Group for the WHO Mental Health Global Action Programme (MHGap), 2009, a temporary advisor for the WHO EMRO Office maternal and child mental health policy inter-country meetings, 2008 and 2010, and WHO temporary advisor, for women's mental health and child development, 2008. Salmon was President of the European Association for Communication in Healthcare (2010-2012) and is on the Executive Committee. Slade is Secretary General to the International Society for Psychosomatic Obstetrics and Gynaecology 2010-2013; this coordinates groups in 18 different countries throughout the world and impacts globally on research training and policy.

We have **hosted international conferences**. Liverpool was the venue for the 2013 European Congress of Obesity (ECO, 1500 international delegates). The *Perception* group hosted the 2010 International Multisensory Research Forum (IMRF; 200 international delegates) and Experimental Psychology Society and Applied Vision Association meetings. The group will also host the European Conference on Visual Perception (ECVP; typically about 1000 delegates) in Liverpool in 2015. The *Mental Health* group hosted the annual (invitation only) International Conference on CBT for Psychosis (2012) and in 2014 will host a joint clinician-service user conference on 'Power to Communities' with the International Network Towards Alternatives and Recovery (INTAR).