

Institution: UNIVERSITY OF BIRMINGHAM

Unit of Assessment: C26 - Sport and Exercise Sciences, Leisure and Tourism

a. Context

The School's research impact mission is to serve society by informing and supporting the complex physical activity needs of diverse individuals and communities. The following examples illustrate the range of impacts achieved in selected beneficiary groups during the 2008 – July 2013 period.

Participants and policy makers in elite sport

Our impact is in performance improvement, where we identify and respond to the needs of elite athletes and governing/policy bodies. Examples include: the Dutch team cycling team (Rabobank) where research (Li) on the Q factor has led to a new method to facilitate performance; UK Sport where research (Grix) on governance structures in UK Olympic/Paralympic governing boards has resulted in revised structures; WADA who have used Boardley's research on psychosocial processes in drug use in sport to inform prevention policies and raise public awareness; the Scottish Rugby Union who have collaborated with our staff (Duda, Cumming) to develop a bespoke mental skills training programme that has benefited players and coaches, and Case Study 1. These beneficiaries are served by two of our School's research themes: Optimal Performance and Effective Learning.

'Hard to reach' and physically inactive groups

The School believes that so called 'hard to reach' groups are users whose needs are neither understood nor met by current physical activity (PA) policy and provision. Key impacts are a) gaining a better understanding of the needs of these beneficiaries *from their perspectives* and dispelling myths about them to b) inform and influence policy and the design of interventions. Examples include South Asian women and Muslim girls (Case Study 4) and older adults in Thogersen-Ntoumanis' research on ineffective exercise interventions and the development of new, self-regulation strategies for optimal engagement. Beneficiaries are served by three of our cross cutting research themes: Active Lifestyles, Effective Learning and Healthy Ageing.

Patients and clinicians

We are working increasingly closely with hospitals, clinicians and patients. Key impacts are in improving physical activity programmes for patients, and informing/supporting clinicians; e.g., exercise referral schemes have been made more effective by research on a Self Determination Theory-based intervention (Case Study 4); Stroke patients with perceptual problems were taught new wheelchair navigation skills (Punt) with the advice of a patient panel; Cardiologists and rheumatologists are supported to bridge the gap between basic/clinical sciences through regular research meetings (Fisher et al) leading to a bilateral flow of information; and we are educating medical students and clinicians about the benefits of exercise through the innovative 'BeTheChange' programme (awarded CPD points by the Faculty of Sport & Exercise Medicine). These beneficiaries are served by two School themes: Movement Rehabilitation and Healthy Ageing.

b. Approach to impact

In order to address the complex needs and interests of diverse beneficiaries, the School engages in multi-method research spanning biological and social sciences, and extending from basic mechanisms to the translation of findings in applied settings. The School bases its approach to impact on two key principles:

Principle One: in order to serve (rather than mislead or harm) society, impacts must derive from the highest possible standards of scientific research

Our research is organised and developed in four broad discipline-based groups, each of which has a critical mass of researchers. The cognate groups are: (i) Exercise Physiology with Metabolism and Nutrition; (ii) Sport & Exercise Psychology with Behavioural Medicine; (iii) Sport & Exercise Pedagogy with Policy; and (iv) Motor Control/Movement Rehabilitation. Quality/vibrancy of the sciences underpinning our research themes is a central plank of our approach to impact.

Principle two: in order to meet society's needs, researchers must have a clear understanding of the needs of the constituents they seek to serve.

Adherence to this principle has informed the development of the School's five multi/interdisciplinary research themes signalling key beneficiary groups and reflecting a life-course

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approach to impact. The five themes are: Active Lifestyles, Effective Learning, Optimal Performance, Movement Rehabilitation and Healthy Ageing. The School engages with beneficiaries at the most appropriate stages of research, and this is central to our impact approach. The following examples are illustrative of our two principles in action during the REF period.

Engaging with policy makers Our approach centres on maintaining an open dialogue with policy makers across the range of our activities to ensure we are aware of their needs and they understand what research can (and cannot) offer. For example, recognition for our leading research in motivation (Ntoumanis) has led to consultation with Sport England and the inclusion of new questions on the face to face survey Sport England conducted in parallel with Active People Survey 6; based on a sustained programme of excellence in practice-related research on PE, we have been consulted by Government on the development of the UK National Curriculum (Armour); we invest time and expertise in local policy commissions and engagement with the Birmingham Commission on Healthy Ageing in the 21st Century (Thompson) and this resulted in a report and briefing for the House of Lords' Policy Committee on Healthy Ageing in a Multi-Cultural Society.

Engaging with National and International Governing Bodies (NGBs) of Sport Our approach is based on developing effective and sustained relationships with NGBs. For example, a series of nine research projects funded by the FA (Griffiths, Armour, Quested, Duda) has been conceived, designed and developed in collaboration with key FA personnel and stakeholders; internationally, engagement with a wide range of non-academic beneficiaries, including the Football Associations of England, France, Norway, Spain and Greece, the Professional Footballers Association (PFA) and professional football clubs has resulted in a Europe-wide and culturally relevant coach education programme (Empowering Coaching™, CS 3). At the performance end of the spectrum, Ntoumanis has developed a productive relationship with British Cycling and Irish Cycling and his research on the contrast between adaptive and dysfunctional motivational environments has been incorporated into educational material for all trainee and qualified Level 3 coaches. Our extensive educational links with Golf have led to research on golf kinematics (Bridge) that has changed the physical training and coaching of elite junior golfers resulting in more effective performance and fewer injuries. In a high profile example of impact, the School offered access to equipment, facilities and consultancy (Li) to the Jamaican AAA relay team and triathletes who were based at the University prior to the London 2012 Olympics. The impact of this strategy upon performance was recognised by the Jamaican AAA and has led to continued consultancy in the run-up to Rio 2016. Further evidence of this approach to impact is seen in the long term relationship we have developed with Elmhurst School of Dance (Duda, Quested, Cumming) leading to the delivery of evidence-based education and services for dancers, management, artistic/academic teachers, pastoral and health support staff.

Engaging with Business and Charities Our approach to impact is based on investing time in collaborations to ensure we understand specific needs and are able to support public awareness initiatives. For example, we have developed effective relationships with the Alzheimer's Society and Alzheimer's Research UK (Aldred) including participation in public meetings and expert panels on our research investigating the effects of lifestyle on cognitive function and risk factors in dementia. We communicated via the national media to raise public awareness, i.e. for a series of programmes for the BBC entitled 'Defeating Dementia'. We also coordinate the ARUK Midlands network of researchers and physicians working on dementia, including an annual public engagement forum. In collaboration with the President of the British Rheumatology Society, we have developed a forum for practitioners and allied health professionals to ensure we can add expert comment on developing appropriate physical activities for patients. In examples of engagement with business beneficiaries and understanding their specific needs, researchers calculated the economic impact of increasing stair use (CS 2) and this was included in a briefing document circulated by Chambers of Commerce; and employees were consulted in the development of a walking-based physical activity intervention (Thogersen-Ntoumani).

Engaging with the public Our approach to impact is multi-layered to address the need to engage, understand and communicate with different constituencies. For example, to extend the reach and influence of our research, the School participates in Intra and Inter University Research

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centres. We are a participant and theme lead in the MRC-ARUK Centre for Musculoskeletal Ageing Research offering access to a unique beneficiary and research participant group (the Birmingham 1000 Elders). Through the Centre, we have also collaborated to develop a new national training programme and video on exercise for the chair bound elderly and their carers (Thompson, Greig, Thogersen-Ntoumani). We also invest time and resource in public awareness activities; for example in a project undertaken on vestibular control of balance in older adults (Reynolds) open days were organised to engage older adults and their carers to learn more about their practical needs. Engagement with the public is formalised in research trials where beneficiaries are engaged through problem setting, applications for funding and involvement in project leadership and management. For example, in the QUEST project (Queen Elizabeth physiotherapy post lumbar discectomy Study) beneficiaries are engaged as co-investigators and in the independent steering group. We also actively seek to harness the power of the mass media to communicate with the public. Examples during the REF period include all the major national TV stations and press; local stations; international press; special interest publications (e.g. Men's Health, Runners World, Business Network, Dancing Times); company alerts (e.g. Abbott Nutrition) and websites. In a recent example (the BBC's 'Trust me I'm a Doctor', Thompson et al) we raised public awareness about the myths on obesity, fitness and health (3.2 million viewers).

Support from College and University Our impact strategy is supported by the College of Life and Environmental Sciences, and the University. The College organises an annual impact conference with invited speakers from key stakeholders in charities, industry and outreach. The University's Research and Innovation Services unit mediates between academics and businesses for collaboration and commercialisation. The unit is currently supporting a new Social Enterprise centred on Empowering Coaching (led by Duda) and developing cost effective talent detection tests for football clubs (Li). A University-wide initiative, the Institute of Advanced Studies, provides pump prime funds for multi-disciplinary workshops with external stakeholders (7 School-led to date). The Press Office is proactive in identifying opportunities for expert comment.

c. Strategy and plans

As the focus on impact has become increasingly prominent, the School has adapted its policies, practices and structures. For example, in August 2012, The Department of Sport Pedagogy was combined with the School of Sport and Exercise Sciences. This merger extended the disciplinary range of the School's research, and co-location of staff has facilitated links between its basic, applied and translational research; for example, informing the practitioner aspects of teaching and coaching. The recent merger of Physiotherapy into the School offers new opportunities to extend existing motor control expertise and translate research to meet beneficiary needs in trauma/rehabilitation. E.g. basic science concepts from movement control physiology and neuroplasticity are being used in clinical trials in falls and traumatic brain injury rehabilitation.

The following impact-specific policies and strategies will ensure we are able to maintain and extend our impact: (i) We are piloting the use of Research Theme Leads to monitor and initiate impact activity; (ii) Senior staff will mentor on impact as part of the internal review of grant proposals; (iii) impact activity will be recognised as part of research workload; (iv) specific vehicles for impact are being funded; e.g. the recently established Centre for Policy Research in Sport and links with emerging economies such as Brazil; (v) we are building stronger partnerships with local beneficiaries taking advantage of our geographical location in a major and diverse city and our proximity to the largest hospital in Europe; (vi) we have developed an Impact section on the School's website.

d. Relationship to case studies

The four case studies illustrate our two core impact principles, our approaches and the breadth of our beneficiary groups. CS 1 (Carbohydrate Delivery) provides evidence of excellent basic science and understanding performer needs; CS 2 (Stair Climbing) illustrates our active lifestyles theme, policy influence and meeting public needs; CS 3 (Empowering Coaching™) offers evidence of sustained engagement with NGBs and our commitment to translational research; CS 4 ('Hard to Reach') is evidence of our determination to understand and address the needs of groups that are traditionally underserved in physical activity interventions and policies.