The findings of a series of engagement activities exploring

THE CULTURE OF SCIENTIFIC RESEARCH IN THE UK

NUFFIELD COUNCIL ON BIOETHICS

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Summary

BACKGROUND

In 2013, the Nuffield Council on Bioethics embarked upon a series of engagement activities that aimed to inform and advance debate about the ethical consequences of the culture of scientific research in terms of encouraging good research practice and the production of high quality science. Under the guidance of a Steering Group, the activities of the project included:

• An online survey that received 970 responses.
• Fifteen discussion events co-hosted with universities around the UK involving around 740 speakers and participants.
• Evidence-gathering meetings with funding bodies, publishers and editors of scientific research, and academics from the social sciences.

A detailed analysis of the survey responses, a summary of the discussion events, and a background paper about the culture of scientific research in the UK are available at: www.nuffieldbioethics.org/research-culture

Most of the people who took part in our activities are involved in research being undertaken at higher education institutions (HEIs). A wide range of views, perceptions and experiences about scientific research in HEIs were raised, and these are summarised in this report.

WHAT WE HEARD

What is high quality science?

When asked to pick from a list of options, high quality research was described by survey respondents as: rigorous, accurate, original, honest and transparent. In addition, collaboration, multidisciplinarity, openness and creativity were frequently raised as important components in the production of high quality science. Survey respondents are motivated in their work by improving their knowledge and understanding, making scientific discoveries for the benefit of society, and satisfying their curiosity.

Concerns about the culture of scientific research

Competition
High levels of competition for jobs and funding in scientific research are believed both to bring out the best in people and to create incentives for poor quality research practices, less collaboration, and headline chasing.

Funding of research
There are concerns about a loss of creativity and innovation in science caused by perceived funding shortages, strategically-directed funding calls, short-term funding, and trends towards funding of safer research projects and established research centres. However, support for multidisciplinary and collaborative work was praised.

Assessment of research

The perception that publishing in high impact factor journals is the most important element in assessments for funding, jobs and promotions is creating a strong pressure on scientists to publish in these journals. This is believed to be resulting in important research not being published, disincentives for multidisciplinary research, authorship issues, and a lack of recognition for non-article research outputs. The Research Excellence Framework (REF) is thought to be a key driver of the pressure to publish in high impact journals, with many unaware or untrusting of the instructions given to REF assessment panels not to make any use of journal impact factors in assessing the quality of research outputs.

Attempts to assess the societal and/or economic impact of research are welcomed by some, but others believe this is creating a culture of short-termism and is pushing aside interest in curiosity-driven research, as well as resulting in researchers exaggerating the potential application of research in grant proposals.

It was suggested that research organisations should better recognise the wider activities of researchers, such as mentoring, teaching, peer review and public engagement.

Peer review is thought to be having a positive effect on science but concerns were raised about unconstructive reviewer comments and shortages of peer reviewers. The importance of peer reviewers being given training, time and recognition for their work was emphasised.

Research integrity

Fifty-eight per cent of survey respondents are aware of scientists feeling tempted or under pressure to compromise on research integrity and standards, although evidence was not collected on any outcomes associated with this. Suggested causes include high levels of competition in science and the pressure to publish. Training in good research practice is thought to be important in creating conditions that support ethical research conduct.

Career progression and workload

Features of researcher careers, including high competition for jobs and funding and heavy workloads, are thought to be resulting in a loss of creativity and innovation in science. Suggestions for improvements include: fair and consistent recruitment processes, better provision of mentoring and career advice, tackling negative attitudes towards those who leave academic science, and good employment practices for women.

OBSERVATIONS AND SUGGESTIONS FOR ACTION

The Steering Group hopes that the findings of this project provide useful evidence that will advance future debate on the culture of scientific research in HEIs. In the context of what scientists told us motivates them in their work and what they believe to be important for the production of high quality science, the findings lead us to make some general observations:

- In some cases the culture of scientific research does not support or encourage scientists' goals and the activities that they believe to be important for the production of high quality science.

- There seem to be widespread misperceptions or mistrust among scientists about the policies of those responsible for the assessment of research.

- Among all the relevant stakeholders, concerns about the culture of research are often on matters that they think are outside their control or are someone else's responsibility.

We believe there is a collective obligation for the actors in the system to do everything they can to ensure the culture of research supports good research practice and the production of high quality science. As such, we provide a number of suggestions for action for funding bodies, research institutions, publishers and editors, professional bodies and individual researchers (see Figure 1). Key examples are:

Funders: ensure funding strategies, policies and opportunities, and information about past funding decisions, are communicated clearly to institutions and researchers; and provide training for peer reviewers to ensure they are aware of and follow assessment policies.

Research institutions: cultivate an environment in which ethics is seen as a positive and integral part of research; ensure that the track record of researchers is assessed broadly; and provide mentoring and career advice to researchers throughout their careers.

Publishers and editors: consider ways of ensuring that the findings of a wider range of research meeting standards of rigour can be published; consider ways of improving the peer review system; and consider further the role of publishers in tackling ethical issues in publishing and in promoting openness among scientists.

Researchers: actively contribute to the adoption of relevant codes of ethical conduct and standards for high quality research; use a broad range of criteria when assessing the track record of fellow researchers; and engage with funders, publishers and learned societies to maintain a two-way dialogue and contribute to policy-making.

Learned societies and professional bodies: promote widely the importance of ensuring the culture of research supports good research practice and the production of high quality science; and take account of the findings of this report in relation to guidelines for members on ethical conduct and professionalism.

Photos: Participants at the discussion event held at University College London

Figure 1. Suggestions for action to support good research practice and the production of high quality science

DISSEMINATION

Publication of a wide range of rigorous research

Openness and data sharing between researchers

FUNDING

Adoption of diverse funding approaches

Clear communication of funding opportunities and assessment criteria

ASSESSMENT

Use of a broad range of criteria in research assessments

Recognition of the wider activities of researchers

Training and recognition for peer reviewers

GOOD RESEARCH PRACTICE AND HIGH QUALITY SCIENCE

RESEARCH GOVERNANCE AND INTEGRITY

Training in good research practice

Openness about consequences of misconduct

Adoption of appropriate ethical review processes

CAREERS

Mentoring and career advice

Adoption of employment practices that support diversity and inclusion

Training and recognition for leaders in research